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Cost and Price Increases in Higher Education: Evidence of a Cost Disease on Higher Education Costs and Tuition Prices and the Implications for Highes Education Policy

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Cost and Price Increases in Higher Education: Evidence of a Cost Disease on Higher Education Costs and Tuition Prices and the Implications for Higher Education Policy

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ABSTRACT

As concern over rapidly rising college costs and tuition sticker prices have increased, a variety of research has been conducted to determine potential causes. Most of this research has focused on factors unique to higher education. In contrast, cost disease theory attempts to create a comparative context to explain cost increases in higher education. The theory postulates that all heavily labor-intensive industries will experience faster than average cost increases, based on the limitations in leveraging technology to increase productivity. This research attempts to analyze the extent to which a cost disease affects college costs and tuition sticker prices in two distinct segments. First, trend analysis is used to analyze components of the higher education price index from 1961 through 2008 to assess the extent to which labor costs have driven higher education costs over time. Second, changes in higher education costs and tuition prices are compared against components of the Personal Consumption Index of the National Income and Product Accounts from 1961 through 2008 to determine the extent to which a cost disease differentially impacts labor intensive sectors of the economy.

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I would like to dedicate this dissertation to my parents. Although their own education was interrupted by poverty and war, as immigrants to the United States they nevertheless instilled in their children the importance of an education. Thank you for all your sacrifice and support.

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CHAPTER I: INTRODUCTION

Over the last 45 years, college tuition prices have been rising approximately twice as fast as the rate of inflation, as measured by the consumer price index. Students, parents and members of Congress have been expressing growing unease about the affordability of a college education, and rising frustration with colleges over tuition increases. Over the last decade, Congress has mandated a variety of studies to determine the causes for these faster than inflation increases, and has increasingly threatened regulatory solutions in an attempt to curb what is seen as run-away tuition prices.

As concern over tuition prices has increased, a great deal of research has been conducted to determine potential causes. Much of the discussion has centered on identifying factors unique to the higher education industry which may be responsible for excessive price increases. A great deal of this research has focused on the extent to which the non-profit structure of the vast majority of higher education institutions has influenced institutional goals and aspirations, while fueling needless spending and engendering excessive competition among institutions.

In contrast, a parallel body of research has focused on the extent to which rapidly rising tuition prices are related to a much broader phenomenon potentially affecting all labor intensive industries. Known as Cost Disease Theory, this line of inquiry postulates that all labor-intensive industries will experience faster than average cost increases, based on limitations in leveraging technology to increase productivity.

Determining the causes for rapidly rising tuition prices may have important policy implications; Federal and state public policy and resource allocation choices affecting higher education will hinge on the assessment of the causes for tuition increases. If

escalating costs are caused by institutional greed or a skewed priorities leading to excessive spending, then Congress may justifiably impose regulatory solutions as a way to control institutional spending, or may shift resources away from higher education to more pressing public policy issues. However, if higher tuition is due to factors beyond institutional control, as described by a cost disease, such causes, if properly understood, may actually justify an enhanced public reinvestment in institutions of higher education.

This research examines the competing theories attempting to explain cost and price increases in higher education, and attempt to determine the extent to which a cost disease can account for cost increases in higher education, and by extension, higher than average tuition price increases. If a cost disease is primarily responsible for driving higher education costs, evidence for this should be found by deconstructing components of the higher education price index, as well as by comparing higher education price increases to those in other industries. If a cost disease theory is correct, faster-than-inflation price increases should also occur in other labor intensive industries, irrespective of whether the firms in these industries are predominantly non-profit entities or profit oriented firms.

Statement of the Problem

Concern over rapidly rising tuition prices is not new; just 1 year after passage of the Higher Education Act ("The Higher Education Act of 1965," 1965), Baumol and Bowen (1966) were already speculating on the potential causes for rapidly rising tuition prices. By 1973, the Carnegie Commission on Higher Education reported that, between 1929 and 1960, the cost per credit hour at colleges and universities increased an average rate of over 2 ½% above the consumer price index (1978). Congress created the National

Commission on the Financing of Postsecondary Education in 1972, in part because of Congressional concern over rapidly rising college costs (Finn, 1978). By 1990, a Brookings Institution study noted that between 1980 and 1987, tuition prices rose at twice the inflation rate, which was 10%, even outpacing rapidly rising health care costs, which grew at an average annual rate of 8% (Hauptman, 1990).

Anxiety over the rising cost of a college education, especially with the "sticker prices" of published tuition and fees, became widespread during the 1990's, in part due to the slow growth of family income relative to increases in tuition prices (Ehrenberg, 2000). Between 1981 and 2000, after adjusting for inflation as measured by the consumer price index (CPI), tuition more than doubled at public not-for profit 4-year colleges and universities, while median family income grew by 27% and financial aid per full-time equivalent student increased by 82% (Horn, Wei, Berker, & Carroll, 2002). Students and their families have been expressing growing unease about the affordability of a college education; the proportion of adults expressing concern that qualified and motivated students will not have the opportunity to receive a college education increased from 45% in 1998 to a record high of 62% in 2007, and more than 75% of parents indicated anxiety over paying for their children's college education (Immerwahl & Johnson, 2007).

Public concern about rising tuition prices led Congress to establish the National Commission on the Costs of Higher Education in 1997, with a mandate to review college costs and prices (Jones, 2001). As part of the 1998 Amendments to the Higher Education Act, Congress mandated the study of expenditures at higher education institutions ("1998 Amendments to the Higher Education Act of 1965," 1998). Concern over the rate of tuition sticker price increases became an increasingly important issue during successive

reauthorization hearings. With the average price of a college education increasing at twice the rate of inflation between 1981 and 2000, some of the proposed legislation in anticipation of the 2004 Reauthorization of the Higher Education Act even contained provisions which threatened the loss of federal student assistance grants to colleges which increased tuition more than double the inflation rate ("Affordability in Higher Education Act," 2003). This was later amended to become a provision requiring higher education institutions to report annual tuition and fee increases against a suggested "college affordability index," defined as twice the rate of inflation. Institutions classified as "excessive" would be required to provide reports, plans, and a schedule for controlling future tuition charges ("College Access and Opportunity Act," 2003).

While the provisions failed to pass, they suggest the degree of concern over price increases in higher education, articulated by both Congress and the public, and uncertainty about the cause. Meanwhile, although much attention has been focused on the issue of college cost and prices, intensified by Congressional and state mandated studies, there is still a great deal of confusion concerning the nature of these faster-than-inflation cost and price increases.

The concern over tuition increases reflects the unique role of higher education as one of the most important mechanisms of equality of opportunity, and the anxiety reflects public fear that a college education may be priced beyond the range of students and their families. At its best, the attention on cost and price has stimulated an important discussion about the function of higher education and its relationship to societal needs and aspirations, along with an increased appreciation of the nexus between access to higher education and equality of opportunity.

Unfortunately, much of the debate has been polemical, stemming from a belief that colleges and universities have been profligate in their spending, and indifferent to the needs of students and their families, as well as society at large. This feeling of frustration and confusion was expressed in a recent report sponsored by Congressmen John Boehner and Howard McKean, which stated, "Higher education is deemed such an essential piece of the success puzzle, colleges feel justified in routinely kicking middle-America in the teeth" by increasing tuition prices (Wolanin, 2005, p. 46).

Spurred by the attempt to curb tuition price increases, a considerable body of research has been conducted to determine the most likely causes. Two broad sets of causes have been offered to explain the faster-than-inflation costs associated with higher education: (a) causal forces exclusively associated with higher education, and (b) the Theory of the Cost Disease, which attempts to place increasing higher education cost, and by extension, tuition price increases, within the framework of cost pressures facing all labor-intensive industries.

In seeking to find answers to rapidly rising tuition sticker prices, much of the focus has centered on whether there are factors unique to higher education which drive cost increases faster than the consumer price index, which then become reflected in higher tuition prices. While these studies have identified a number of potential "cost drivers," which include the goals associated with higher education institutions, accelerating competition among institutions, the growth of institutional aid, as well as the increasing costs of technology, state and federal regulations, faculty compensation workload policies, these are perhaps as unhelpful as they are comprehensive (Brennan, 2001, p. 15; Cunningham, Wellman, Clinedinst, Meriosotis, & Carroll, 2001, p. 21).

In contrast to explanations centered on factors unique to the higher education industry, the Theory of the Cost Disease attempts to create a comparative context to explain cost increases in higher education; the theory postulates that all heavily labor-intensive industries will experience faster-than-average cost increases, based on limitations in leveraging technology to increase productivity. This provides a basis to test the validity of the theory both in potentially explaining higher education cost pressures as well as the extent to which a cost disease influences other labor-intensive industries (Archibald & Feldman, 2008).

Research Questions

This research approaches assessing the extent to which a cost disease affects cost and price increases within higher education in two distinct segments; cost disease theory postulates that labor-intensive industries should experience faster-than-inflation price increases compared to industries associated with the manufacturing sector. According to the theory, this is directly related to the underlying nature of an industry's production function. Unlike the manufacturing sector, where labor is incidental to the production process, labor is itself the primary output associated with labor-intensive industries, and therefore, less amenable to productivity increases associated with the introduction of labor-saving technology. Researchers should be able to discern both cost and price increases first, by examining relative changes in prices over time among the components associated with the production process, and secondly, by changes in relative prices among the industry under study compared more generally to those associated with other labor intensive industries as well as those associated with the manufacturing sector.

This research utilizes two distinct datasets and two different analytical methods to analyze the extent to which the presence of a cost disease can explain both cost and price increases in higher education. First, trend analysis is used to analyze components of the higher education price index to assess the extent to which labor costs have driven higher education costs over time.

While evidence that the labor component of the higher education production function has been driving higher education costs may provide important evidence supporting the presence of a cost disease in higher education, by itself this is insufficient evidence for a cost disease. The theory of a cost disease also implies that increases in higher education costs should also reasonably mirror cost increases in other labor-intensive industries, which should also be higher than those associated with industries in the manufacturing sector.

Second, to examine the extent to which higher education is affected by a cost disease, the researcher compares changes in higher education cost and prices to other labor intensive industries, in addition to the manufacturing sector of the economy. This provides some additional challenges. The Higher Education Price Index was specifically created to analyze costs associated with components of higher education's production function. Nothing quite like it exists among other consumer product categories. However, there is a way to compare relative changes in prices in higher education to other consumer purchases: the Personal Consumption Expenditures (PCE) Indices of the National Income and Product Accounts, first created during the great depression as a way to assist the Roosevelt Administration in developing and monitoring New Deal economic policy, provides indices measuring the type of goods and services purchased over time.

These can be used to compare relative changes in prices of higher education compared to consumer purchases associated with other service sectors, as well as those associated with the manufacturing sector.

However, beyond reflecting intrinsic production costs, higher education prices also encompass variability associated with relative changes in sources of support, especially from changes in revenue associated with state subsidies for public institutions, and gift and endowment income for private institutions. Declining revenue streams associated with public and private giving may exacerbate price increases during periods when federal and state budgets are constrained, or economic circumstances or changes in financial markets constrain private giving.

Thus, in attempting to assess the relative changes in prices across labor-intensive and manufacturing industries (using the NIPA PCE data), the researcher also compares higher education costs as well (based on HEPI data) using ANOVA. Including both higher education cost and price indices when conducting relative assessments of a cost disease among various sectors of the economy will help account for potential issues associated with burden shifting.

The primary research question of this study is: To what extent can cost and tuition sticker price increases in higher education be explained by the presence of a cost disease affecting colleges and universities? Auxiliary questions include:

1. What are the main cost drivers responsible for driving the Higher Education Price Index? This research utilizes trend analysis examining components of the higher education price index over time. Analysis of the HEPI index reveals that higher education costs significantly outpace price increases associated with the consumer price index.

However, among components of the higher education price index, certain sub-indices may be increasing at a rate even faster than the HEPI average; Cost drivers are defined as those components of the higher education price index which are increasing at a rate faster than the aggregate HEPI average. This specifically addresses issues associated with the cost of producing higher education and the relative changes in component categories over time.

2. To what extent are labor costs driving overall costs within higher education? This research utilizes trend analysis examining components of the higher education price index over time. If labor costs are increasing faster than the aggregate HEPI index, they will be considered cost drivers propelling higher education costs.

3. To what extent can a cost disease explain rapidly rising higher education costs and tuition sticker prices? Research analyzing the relationship between a cost disease and higher education cost and price increases involves two distinct components; first, using trend analysis associated with auxiliary research questions 1 and 2, the extent to which salary-related costs are driving total production costs within the higher education industry are examined. Secondly, using ANOVA, cost increases associated with higher education (as measured by the higher education price index), price increases associated with higher education (as measured by the National Income and Product Accounts Personal Consumption Expenditure Index) and price increases associated with durable goods, non-durable goods, and services are compared to determine the extent to which both cost and price increases mirror those associated with the other Service sector consumption items.

Cost Disease Theory suggests that price increases associated with service sector industries should outpace those associated with the manufacturing sector, (represented by

NIPA PCE durable goods purchases), while non-durable goods, which are generally more labor-intensive than those associated with Durable Goods, but less dependent than services on labor should also have price increases higher than those associated with the pure service sector. Additionally, Cost Disease Theory suggests that cost increases associated with the Higher Education Price Index should outpace price increases associated with Durable and Non-Durable Goods, while they should be similar to price increases associated with Service Sector goods. ANOVA post-hoc multiple comparison tests will be used to assess the extent to which statistical differences exist among higher education HEPI cost increases, NIPA higher education price increases, NIPA Durable good increases, NIPA Non-Durable Good price increases, and increases associated with NIPA-classified service items.

ANOVA post-hoc multiple comparison tests in which HEPI cost increases, NIPA higher education price increases, and NIPA Service Good increases are statistically different (at .05 level of significance) from price increases associated with Durable and Non-Durable Goods will be considered evidence that a cost disease impacts both higher education in particular and service sector purchases more generally.

4. Are there similarities between increases in higher education costs and tuition sticker prices and prices in other labor intensive industries? ANOVA is conducted to assess the extent to which the NIPA Higher Education Personal Consumption Expenditure Index mirror those associated with other Service Industries during the period between 1961 and 2008. Cost Disease Theory suggests that Price Increases associated with higher education (based on the NIPA Personal Consumption Expenditures) should approximate those associated with the broader Services category of the NIPA Personal

Consumption expenditures. An ANOVA post-hoc comparison test will be performed for the NIPA higher education PCE and the NIPA Service category PCE; price increases in the higher education NIPA index and those associated with the broader NIPA Services category will be considered similar if the ANOVA post-hoc comparison test (at a .05 level of significance) is not found to be statistically significant.

5. Are there differences between price increases in labor intensive industries compared to those associated with the manufacturing sector? ANOVA is used to compare both cost increases associated with the Higher Education Price Index, as well as price increases associated with the National Income and Product Accounts for Higher Education, Durable Goods, Non-Durable Goods and Services. The extent to which there are similarities or differences between prices associated with durable and non-durable goods and those of the service sector will provide basic evidence about the presence of a systematic cost disease associated with service sector industries. An ANOVA post-hoc comparison test will be conducted among the NIPA PCE price indices associated with Durable Goods, Non-Durable Goods and purchases associated with the NIPA Service category. After conducting an ANOVA post-hoc comparison test (conducted at the .05 level of significance), price increases in the manufacturing sector will be considered different from those in the service sector if price increases associated with the NIPA Service category are found to be statistically significantly different from those associated with the NIPA Durable and Non-Durable Goods category.

Importance of the Topic

A variety of very different explanations have been offered for the causes of the persistent price increases facing students and families, with important implications for

public policy guiding higher education, particularly with funding allocation decisions. Reacting to the complaints of parents and students, both Congress and state legislatures have been seeking ways to control tuition price increases, or at least reduce the rate of cost and price increases. There seems to be genuine frustration with colleges and universities, with many believing that higher education institutions are willfully increasing prices beyond what is necessary. In the latest Public Agenda survey of attitudes toward higher education, 52% of those surveyed responded that colleges were more concerned about their "bottom line" than providing a quality educational experience for students, while 44% responded that waste and mismanagement were major factors in driving higher education costs (Immerwahl & Johnson, 2007). Additionally, 56% of respondents indicated that colleges and universities could substantially cut their budgets and lower tuition without sacrificing quality, and 58% either agreed or strongly agreed that colleges and universities could absorb a much larger number of students without affecting quality or increasing prices (Immerwahl & Johnson, 2007, p. 25).

These attitudes are not reserved to public opinion surveys, as family concern over the affordability of a college education has increased, politicians have been expressing mounting frustration as well. Amendments to the Higher Education Act in the House of Representatives proposed in November, 2007 reflect a growing bipartisan impatience with rising tuition prices, with the assumption that colleges and universities are themselves to blame. Under these proposed amendments, institutions which increase annual net tuition greater than the percentage increase in the higher education price index would be required to submit a report to the Secretary of Education describing the factors which led to its tuition increases, identity the three areas of the institution's current

budget with the highest increases, submit 3 prior years of filings with the Internal Revenue Service (or IRS) to the Department of Education, and address planned institutional actions to reduce its net tuition in the future ("Higher Education Opportunity Act," 2007).

Meanwhile, skyrocketing costs have been placing unprecedented stress on institutions and faculty. As cost pressures have mounted, the total number of adjunct professors and the number of courses taught by adjunct faculty has increased substantially in the last 30 years, principally as a way to reduce costs (Schuster & Finkelstein, 2006, p. 40). The economic pressures on faculty have been so extensive that some have questioned the very future of the profession as even new permanent faculty are increasingly hired as non-tenure track positions (Schuster & Finkelstein, 2006, pp. 175-180).

The amendments proposed by Republican representative Castle which called for those institutions identified as having excessive tuition increases to implement procedures to cut costs or else face a 10% reduction in federal aid were ultimately withdrawn. However, Representative Miller, the Democratic Chairman of the Education and Labor Committee described Castle's amendments as "very tempting," warning, "I hope the [higher education] community is listening closely to this" adding that the bill's provisions were "not the end of the story" (Lederman, 2007). State politicians have expressed similar concern as well.

Federal and state public policy and resource allocation decisions affecting higher education will hinge on the assessment of the causes for cost and price increases. If these faster-than-inflation increases are indeed caused by institutional greed or

mismanagement, or if this is merely believed to be the cause, Congress and state legislatures may justifiably impose regulatory solutions on institutions, as threatened by the proposed amendments in the last Higher Education Act, which warned of the loss of Federal financial aid to institutions which failed to lower price increases.

Moreover, if institutional greed, mismanagement, or skewed priorities are the cause for tuition price increases, Congress and state legislatures may shift scarce resources to what are believed to be more pressing public issues. If institutions indeed have enough funding, but it is merely being misdirected through a warped sense of priorities, then Congress and states legislatures may feel justified in reducing the relative resource allocations invested in higher education, believing this may actually help realign institutional allocations with public policy objectives.

However, if cost and price increases facing higher education are rooted in other causes, such as those associated with higher education's production function, this may require very different public policy choices. Such causes, if properly understood, may actually require a public reinvestment in higher education to strengthen student access and ensure higher education's continuing function as a primary mechanism of equality of opportunity.

Definition of Terms

While often linked, the terms cost and price are not synonymous. Cost refers to the amount institutions spend to provide education to students, and is measured through expenditures. Price refers to the amount which students are charged and what they pay for educational services. There are several frequently discussed prices, including sticker price, price of attendance, and net price. Sticker price refers to the established tuition and

fees charged by an institution, while net price refers to tuition and fees excluding financial aid. When Congress expresses concern about prices, it is usually referring to sticker prices (Cunningham et al., 2001). (For a more detailed definition of terms, please see Appendix A.)

In general, costs are associated with the factors of production; price is the amount of money charged to students in terms of tuition and fees. However, it should be recognized that students rarely pay the full cost of the education they receive, even when paying full tuition, since colleges and universities receive revenue from a variety of sources to subsidize the costs of education. This general subsidy is defined as the difference between the average price charged to students and the average cost to the institution for providing an education to a student, on a per-capita basis.

CHAPTER II: REVIEW OF THE RELATED LITERATURE

Researchers attempting to explain rapidly rising cost and price increases in higher education fall into two broad camps: those seeking causes unique to higher education, and those attempting to explain cost and price increases as part of a broader phenomenon potentially affecting all labor intensive industries, known as Cost Disease Theory. Theoretical perspectives have drawn heavily from economics and include analysis of the goals associated with higher education institutions as economic firms, the nature of competition associated with the unique market structure of higher education, the influence of affluence and market segmentation in relation to cost and price increases, and the nature of production costs associated with the inputs for higher education. These theories will be explored in greater detail.

Factors Unique to Higher Education

University Goals, Pursuit of Excellence and the Revenue Theory of Costs: Valuation and Higher Education Expenditures

Goals of Non-Profit Institutions and the Pursuit of Excellence

Most researchers attempting to explain rapidly rising costs and tuition prices in higher education begin their analysis with the fact that most colleges and universities are structured as non-profit institutions, which creates significantly different goals and objectives than those found in profit-oriented firms, a line of enquiry beginning with Hansmann (1980). Most institutions of higher education are organized as non-profit enterprises, which stipulate a "non-distribution constraint." While their revenues may exceed costs, non-profit organizations may not distribute profits to owners or

stockholders (Hansmann, 1980; Winston, 1996, 1999). While still facing limitations on possible expenditures, non-profit colleges and universities are not guided by the profit-maximizing goals of business firms, but are motivated by more complex and less clearly defined objectives.

Higher education institutions often define their goals in extremely broad terms such as "the pursuit of excellence" (Winston, 1999), or simply to "be the best" in their educational, research and service missions (Clotfelter, 1996). This not only affects how colleges and universities set their internal priorities, but also the nature of competition among these institutions. The activities and expenditures associated with colleges and universities will be affected by the extremely broad goals associated with the majority of these institutions as non-profit firms. The full implications of the unique structure and aims of higher education were most fully developed by Bowen (1980), and has since become known as the Bowen's Law, or the Revenue Theory of Costs.

Bowen (1980) postulated that cost escalation in higher education may not be strictly related to inherent production costs, but hinged on the potentially unlimited goals associated with colleges and universities, which he described as "Revenue Theory of Costs." While colleges and universities are focused on institutional excellence, prestige, and influence, maintaining these measures of excellence are very expensive. It requires low faculty-student ratios, higher faculty salaries, high proportions of faculty with terminal degrees, and release time for research, as well as extensive library holdings, advanced infrastructure, and equipment. Significantly, the measures on which colleges and universities assess excellence involve resource inputs, all of which are expensive,

rather than output and performance measures assessing student learning and personal development (Bowen, 1980).

Using this as his premise, Bowen postulated that in their quest for prestige and excellence higher education institutions would spend as much money as they could acquire in achieving their aims. Non-profit colleges and universities would raise all they money they could, and spend all the money they raised. The cumulative effect of these pressures would result in ever increasing expenditures (Bowen, 1980). Massy (2003) supported Bowen's conclusion, arguing that while institutions justified tuition increases based on cost increases external to their control, the actual causes for price increases stemmed from their own choices, based on how they defined excellence.

Zemsky and Massy (1995) also cited the relationship between the decentralized nature of university decision making and the constant quest for excellence as contributory factors to the excessive growth of new programs and initiatives, leading to ever increasing cost commitments. They noted that between 1985 and 1990, college and university expenditures grew by 3.81% faster than the rate of inflation. Nearly all of this growth occurred at the periphery of these institutions; for universities, this was primarily associated with the growth of research centers and institutes, operating near independently of the university center. However, the expansion of peripheral activities occurred as well at liberal arts and community colleges, with new degree and continuing education programs (Zemsky & Massy, 1995).

Clotfelter (1996) and Ehrenberg (1999; 2000) reached similar conclusions as well. Clotfelter also noted that spending pressures were reinforced by the mechanisms of shared governance at elite institutions, based on the way they perceived excellence.

> Featuring weak central control, a remarkable degree of freedom accorded to its faculty, and traditions of collegiality in governance, the university lacks any corporate goal other than the pursuit of excellence. When it comes to the research that it undertakes, the university has little to guide it other than an uncompromising devotion to the highest standards inquiry. (Clotfelter, 1996, p. 253)

Massy (2003) recognized there were upward limitations on what colleges can spend. While providing socially desirable goods, most colleges and universities are nonetheless heavily dependent on market forces for operating revenue generated from tuition, which account for 80% percent of the revenue for private colleges, and 28% of the revenue received by public universities. Thus, universities will attempt to maximize perceived value subject to two key resource constraints: the demand for their product, and their available resources (Massy, 2003).

University Goals and Competition for Excellence

A variety of scholars have also noted that the broad and ill-defined goals associated with achieving academic and institutional excellence have also fostered extreme competitive pressures among institutions, fueling still greater pressure on spending to maintain or enhance the relative assessment of institutional quality and prestige (Clotfelter, 1999; Ehrenberg, 2000; Winston, 1996, 2003; Winston & Zimmerman, 2000). According to this theory, pressure to increase institutional spending is compounded by the market structure shaping demand for higher education. The market for higher education is highly decentralized, consisting of thousands of institutions, which are also segmented into groups that compete on relative selectivity and quality (Clotfelter, 1999; Winston, 1999, 2003; Winston & Zimmerman, 2000). However, measures of institutional excellence, quality and prestige can only be defined relative to

other institutions, fueling competition among institutions to be better than others within their peer grouping (Winston, 1999).

Bowen (1980) recognized that, while driven by desires of excellence, competition between institutions placed further pressure on institutional spending, providing very little additional benefits. While Bowen acknowledged that some spending was used to enhance student quality, in actuality, much of it was used in an attempt to enhance the relative reputation of a particular institution and attract new donors. This was done simply to raise the status of one institution relative to another.

Winston (1999) concluded that the pursuit of relative advantage in comparison to peer institutions had become such a driving force in institutional spending that it had developed into a "competitive arms race" driving institutional spending beyond mere necessity:

> the notion is that the players have become trapped in a sort of upward spiral, an arms race, seeking relative position; in the case of education, it may, in the extreme, involve expensive 'competitive amenities', that do not produce sufficient benefit to justify their cost directly, but are important to an individual school because others are offering these amenities. (p. 30)

The nature of gaining relative position among a peer group can not only be very expensive, but also elusive. As Winston (1999) observed, competition may force all institutions to spend ever greater amounts with little relative effect; "In an arms race, there is lots of action, a lot of spending, a lot of worry, but, if it's a successful arms race, nothing much changes. It's the purest case of Alice and the Red Queen where 'it takes all the running you can do, to keep in the same place'" (p. 40).

Wealth, Market Structure, and Competition

A new body of research analyzing how institutional wealth shapes the market niches within which institutions compete has added to the literature attempting to explain cost increases with industry-specific causes (Winston, 1996, 1999, 2003; Winston & Carbone, 2001; Winston, Carbone, & Lewis, 1998). These researchers have provided a new perspective on how the competition for student peer quality and the relative wealth of institutions defines the nature of competition among institutions as well as the structure of the higher education marketplace. From this perspective, cost and price increases can be seen as the residual effects of the mechanism of the market structure associated with the provision of higher education.

Winston (1996) observed that, while still subject to supply-and-demand constraints, the market for higher education is very different from most others. Most institutions of higher education receive the revenue to cover their production costs from two sources, a combination of past and present public and private charitable giving (collectively characterized as "donative resources"), as well as sales revenues charged to student "customers". This diversified revenue base consisting of charitable and commercial sources of revenue allows many colleges and universities to significantly separate the cost of education from the prices they charge. In fact, Winston (1996) described the long term separation of the price students pay and the true cost of providing educational services as one of the most significant features of American higher education.

However, institutions of higher education rely on a highly unique production technology involving the acquisition of student peer quality in their attempt to provide

educational quality to their students. This heavily influences the nature of competition among institutions, with significant impacts on educational cost and price.

Rothschild and White (1995) were the first researchers to recognize the importance of student peer effects as a core component of the production process of colleges and universities as commercial entities. Since the business of higher education was developing human capital, students were a vital input into the production process. Rothschild and White hypothesized that the presence of particular student customers impacts the education received by other students. Thus, the educational quality a student would experience is shaped in part by other students with whom s/he shared his/her studies (Goethals, Winston, & Zimmerman, 1999).

Unlike nearly every other industry, colleges and universities are only able to purchase a key production input from the very students who are also the consumers of the product they are attempting to sell (Winston, 1996; 2003). He defined this unique market structure as a "customer-input technology." The vital role of student peer quality in the higher education production process has important implications for competition among institutions.

Since institutional quality is dependent on the acquisition of student peer quality, colleges and universities engage in fierce competition in an attempt to attract highly qualified students. They do this by offering a combination of general and individual subsidies to students deemed to have desirable academic credentials. The subsidies offered to a student can be seen as a wage rate for the peer quality based upon his/her perceived value to the institution (Rothschild & White, 1995; Winston, 1996).

Winston (1996; 2003) observed there are vast differences in the donative resources available to institutions, which limits the services, quality of faculty, and the amount of general and individual student subsidies they can use to attract highly sought after students to attend their institutions. The great variability in the amount of donative resources available to institutions across the higher education marketplace enforces a strict quality and prestige hierarchy; wealthy institutions are able to sell their product at tuition prices well below the true cost of production, while poorer institutions provide a significantly smaller subsidy. This affects the number of applicants and student peer quality an institution is able to attract (Winston, 1996, 2003).

Wealthy colleges and universities attempt to insure they will continue to maximize student peer quality by strictly controlling whom they will allow to consume their educational services; they can do this by purposely creating excess demand for their product, hinging on their ability to provide value for students seeking enrollment through a combination of general and individual student subsidies. Since institutions vary greatly in their ability to provide subsidies, this reinforces the hierarchy and market segmentation associated with American higher education. The differential resource base available to institutions has broad implications for cost and price increases across the higher education landscape (Winston, 1996, 2003).

Institutions that are able to provide significant donative resources are able to create an excess demand queue for their product, since they are able to provide a substantial return on a student's tuition investment. They use this excess demand queue to select those students whom they feel will contribute to peer quality. Well-funded

institutions are able to create a high quality academic program by ensuring they remain selective in choosing their student body (Winston, 1996).

These factors lead to a heavily segmented marketplace distributed into prestige bands. For those institutions with access to significant donated wealth, there seems to be little incentive to control spending in their quest to maximize student peer quality. In fact, according to the theory, high levels of institutional spending, subsidized by private and public donated resources, reinforces the value which propels relatively large numbers of students to apply for the limited number of seats available at selective institutions. This high-spending relative to price strategy seems to create and reinforce the selectivity associated with the most prestigious institutions.

Merit Aid, Tuition Discounting, and Rising Costs

A significant body of research has identified increases in institutional non-need based aid as a rising component of institutional budgets, especially at private institutions (Clotfelter, 1996; Hauptman, 1997; Mulugetta, Saleh, & Mulugetta, 1997; Wellman, 2001). For most institutions, these expenditures are not covered by institutional endowments, but are associated with the growing phenomenon known as *tuition discounting*.

Tuition discounting is the practice of purposely charging higher tuition sticker prices, while providing significant discounts to students with highly desirable characteristics, such as those with high academic credentials. Institutions engaging in tuition discounting charge those students with less desirable academic credentials a higher tuition price than highly sought after students, while those students who barely meet academic criteria for admittance are charged the full tuition sticker price. Thus,

lower ranked students help subsidize the education of their more academically gifted peers (Baum & Lapovsky, 2006). This practice is often utilized by less highly selective institutions which do not have large endowments to provide scholarships or offer substantial general subsidies to all students. Instead, the tuition discount is targeted to specific students to entice them to enroll at the institution.

The growing reliance on tuition discounting is well documented. As described in a 2001 Carnegie Commission study (Wellman, 2001), the use of tuition discounting has been accelerating, and has been classified as one of the most important causes for increases in tuition sticker prices at private colleges and universities. The spiraling increase in tuition discounting in an effort to increase indices of student quality has even been categorized as an "arms race," increasingly permeating less selective segments of the higher education marketplace (Wellman, 2001).

Some researchers have identified institutional merit based aid as one of the fastest growing components of institutional expenditures. In their *Study of College Costs and Prices, 1988-89 to 1997-98* conducted for the NCES, Cunningham et al. (2001) found that from 1988-89 through 1997-98 expenditures for institutional aid at public institutions grew at an average annual inflation-adjusted rate of 8.1% at research/doctoral institutions, 7.7% at comprehensive institutions, and 6.8% at 2-year institutions. Institutional aid at private institutions grew at even faster rates: between 1988-89 and 1995-96, expenditures for institutional aid at private institutions grew at an average annual inflation-adjusted rate of 8.5% at bachelor's institutions, 8.7% at research/doctoral institutions, and 10.2% at comprehensive institutions (Cunningham et al., 2001).

Even these statistics may mask the true extent of growth in merit aid (compared to increases in all institutional aid) among institutions of higher education. McPherson and Shapiro (2002) suggested that prior research has actually underestimated the full extent that colleges have shifted their institutional aid from need to merit based aid; they examined the merit and need-based awards offered to sample of 7,000 full-time dependent students derived from the National Postsecondary Aid Survey in 1995-96, who had taken the SAT exam.

McPherson and Shapiro (2002) discovered that relatively few students receive an award explicitly defined as merit or non-need based. Of their sample, only 4% of students at public and 15% of students at private colleges received an award classified as merit or non-need, while 22% of the students from public colleges and 52% of students from private colleges received awards designated as need-based (McPherson & Schapiro, 2002). However, they found that even within aid classified as need-based, SAT scores had a significant impact on the size of the award a student received. Low income students entering a public college with a high SAT score received an average of $1,255 in need-based aid, compared to an average grant of $904 for low income students with mid-range SAT scores, and just $565 for low income students with SAT scores categorized as low.

The differences were even greater at private colleges; low income students with high SAT scores received an average institutional need-based grant of $4,741, while low income students with low SAT scores received an average award of $1,028 (McPherson & Schapiro, 2002). The high correlation of not only merit based grants but also aid classified as need-based to SAT scores seems to indicate that colleges and universities are

massively shifting their institutional aid resources toward merit aid as a way to recruit students perceived to be high-achieving (McPherson & Schapiro, 2002).

It seems clear that expenditures on institutional grant aid, particularly merit-based aid often based on tuition discounting, has been one of the fastest growing components of institutional budgets. While the increasing role of merit-based aid in institutional expenditures has been analyzed as a distinct trend in the college cost literature, the work of Winston (1996, 2003) provides an opportunity to place the role of merit-based aid within the broader context of higher education's market structure and its unique customer-input technology.

The theory of the role of the customer as a production input implies that students provide the critical element of peer-quality required by institutions in their attempt to provide a rich educational experience (Rothschild & White, 1995; Winston, 1996). However, the ability to entice highly sought after students to enroll at a particular institution is tied to the institution's ability to offer value to students by providing a large subsidy relative to the cost of attendance (Winston, 1996; 2003). The most elite institutions with the largest donative resources accomplish this by providing a large general subsidy to each student who enrolls. Institutions unable to provide a large general subsidy can attempt to selectively offer individual students generous merit aid awards as an inducement to enroll. Winston's economic model describing the role of students in providing peer-quality and the competition it engenders can help provide a unifying theme to the rise of merit-based aid and tuition discounting as a direct consequence of higher education's market structure, and the competition for student peer-quality.

Inherent Production Cost Factors

As described in the previous section, a significant body of research has focused on the relationship between the aspirations of non-profit colleges and universities and the competition it engenders to explain rapidly rising costs and tuition sticker prices. However, many researchers remain convinced that this is due to the specialized production factors associated with higher education or, at least, exacerbated by these inherent production costs. Put another way, competition may be fueling institutional expenditures, but the factors of production on which institutions compete may be disproportionately expensive, leading to faster than average cost increases, which may then be passed on to students in the form of higher tuition prices. The empirical, descriptive studies mandated by Congress have focused on this issue, attempting to identify whether there are unique "cost drivers" in higher education (Cunningham et al., 2001; Jones, 2001). Other researchers have delved into this potentially powerful explanatory factor as well.

In their *Study of College Costs and Prices, 1988-89 to 1997-98* conducted for the National Center for Educational Statistics (NCES), Cunningham, Wellman, Clinedinst, Meriosotis, and Carroll (2001), attempted to assess the relationship between cost increases in the production function of higher education and their relationship to price increases. This study identified a number of higher education cost drivers, which include facilities, institutional aid, technology, regulations, mission and discipline, faculty compensation and workload policies, as well as class size. Significantly, other than the cost of regulatory mandates, these included nearly all the core inputs used to enhance institutional excellence (Brennan, 2001; Cunningham et al., 2001). Most of these cost

drivers have been identified by other scholars including Bowen (1980), Clotfelter (1996, 1999) and Ehrenberg (1999, 2000) as production factors which consistently outpace increases in the Consumer Price Index, leading to rapidly rising costs.

While driven by desires of institutional excellence, Bowen (1980) acknowledged that costly resource inputs were fundamental to the Revenue Theory of Costs; significantly, excellence was not measured by outcomes assessments of effectiveness in educating students, but in terms of resource inputs which were expensive to maintain and enhance.

In his case study of Cornell, Ehrenberg (2000) supported Bowen's conclusions. While pressure for spending was based on the pursuit of excellence, Ehrenberg described the nature of these costs as the very expensive resource inputs which the pursuit of excellence requires. Elite private institutions seek to deliver the best quality undergraduate and graduate education they can; they will seek as many faculty members as they can to enable small class sizes and allow greater research in cutting edge fields of study. Extending knowledge by engaging in research is also very expensive, requiring not only faculty, but also state of the art facilities, laboratories and equipment. While a great deal of this research is supported by government, corporation and foundation grants or contracts, much of the research is in fact sponsored by universities themselves in the form of reduced teaching loads afforded to faculty engaged in research. There is a constant pressure to reduce faculty teaching loads even further to provide opportunities for even more research. This creates what Massy (1996, 2003) described as a "ratchet effect," leading to the gradual decline in teaching loads and even greater educational costs.

Cost Disease of the Service Sector

The education of students would be impossible without faculty able to teach. The specialized labor of highly educated faculty is one of the most important inputs in the higher education production process. However, some researchers have identified labor costs as one of the factors of production which has increased faster than the CPI; a special literature has developed around the problem of cost increases in heavily labor intensive industries which warrants closer study (Baumol, 1967, 1993; Baumol, Blackman Batey, & Wolff, 1985; Baumol & Bowen, 1965, 1966).

Baumol and Bowen (1965, 1966) were the first theorists to propose that heavily labor intensive industries will face faster than average cost increases compared to those associated with the manufacturing sector. This literature has been extended to potentially explain faster–than-inflation cost increases and their relationship to tuition and fee charges in higher education, and has since become known as the "Cost Disease of the Service Sector."

Baumol and Bowen's (1965, 1966) original research focused on cost increases in the performing arts; they began by noting the puzzling paradox that, while the median income of the majority of performing artists was much lower than most other occupations, the cost of ticket prices seemed to be rising at a pace much more rapid than general inflation. They came to the remarkable conclusion that the explanation centered on the relatively static rate of productivity increases in the performing arts compared with the manufacturing sector, leading to faster-than-inflation increases, not just in the performing arts, but in other service sector related jobs as well (Baumol & Bowen, 1966).

In their initial iteration of their theory, which Baumol and his colleagues later refined, Baumol and Bowen (1965; 1966) hypothesized that the economy could be divided into two broad sectors, a progressive sector which was able to successfully leverage technological innovation, capital, and economies of scale to increase output, and a "stagnant" sector, which was only able to increase productivity inconsistently and sporadically if at all. The classification of the economy into these sectors was not arbitrary, but based on the technological structure of a particular industry.

The key distinction was the role of labor in the production of goods and services within particular industries; in certain industries, particularly manufacturing, labor was only an input into the production process which was incidental to the utility of the finished product. For example, when purchasing a computer, consumers are not necessarily concerned with the amount of labor utilized in the production process, but only about the price and quality associated with the finished product. As long as quality is unaffected or actually improves, and prices remain stable or actually decrease, manufacturers can leverage new technology to reduce the amount of manpower required in the production process (Baumol, 1967).

Baumol and Bowen contrasted these manufactured goods with service sector jobs where labor itself is the end product. In these activities, the quality of the service provided is directly related to the amount of labor allocated to the task. Their now classic example is the production of a live half-hour music quintet; this requires the expenditure of 2 ½ person hours to produce, and any attempt to increase "productivity" by deceasing the amount of labor expended simply leads to a reduction of quality. Significantly,

another example they cited involved teaching, in which class size is used to measure the quality of education provided to students (Baumol, 1967).

The theory proposed by Baumol and Bowen's model has important implications for the relationship between wages and costs in the productive and stagnant components of the economy. They hypothesized that wages in the two components of the economy fluctuated in tandem, while it was possible for wages in one sector to lag behind, fluidity in labor markets meant that this could not occur forever, and that the wage rate of those in both the productive and stagnant sectors increased at approximately the same rate (Baumol, 1967). In general, wages in the manufacturing sector would rise as rapidly as productivity increases per person hour; however, since labor markets are fluid, wage increases in the static sector would generally mirror increases associated with the productive manufacturing sector as well.

The implications for costs in the two sectors were profound. Since wages in both the productive and stagnant sectors of the economy increased at approximately the same rate, which could be mitigated by productivity increases only in the productive sectors of the economy, costs in the nonproductive labor-intensive sector would rise faster than those in the productive sector, which Baumol (1967) hypothesized later would rise "cumulatively and without limit".

The Theory of a Cost Disease has important implications for higher education. The theory postulates that the issue of cost increases in higher education may be part of a broader phenomenon related to all service sector jobs, including the performing arts, health care, postal services, and even automotive repair, among others (Baumol, 1967, 1993; Baumol & Bowen, 1966). The higher rate of cost increases in the service sector

centers on the differential rate of productivity increases between service sector, and manufacturing sector jobs. Higher education is part of a class of activity where the production process lacks effective methods of standardization and automation (Brennan, 2001). Moreover, for many services, particularly education, it is extremely difficult to reduce the amount of labor involved in providing services, since quality of service may be directly related to the amount of labor provided (Baumol, 1993). Therefore, the quality of service usually begins to deteriorate if less time is allocated by doctors, auto mechanics, and college and university faculty in performing their jobs (Baumol, 1993).

In contrast, labor-saving technology can be implemented in the manufacturing sector without a reduction in quality. Consequently, it has been much easier to increase productivity in manufacturing as opposed to jobs in service-related industries (Baumol et al., 1985).

The difficulty of introducing labor saving technology will not allow wages of service sector personnel to be offset by larger productivity gains to the same extent as in manufacturing industries. Thus, service sector jobs will grow more expensive, relative to manufactured goods, even after inflation is accounted for (Baumol, 1967; Baumol & Blinder, 1985).

Even as Baumol and Bowen focused on the performing arts, they were quick to point out the implications of their theory for higher education as well:

> It is evident that the foregoing analysis is applicable to many services other than the performing arts...it helps to explain the financial problems of higher education, which have received even more publicity than those of the performing arts. Education, like the arts, affords little opportunity for systematic and cumulative increases in productivity. The most direct way to increase output per hour of teaching – an increase in the size of classes – usually results in a deterioration of the product which is unacceptable to much of the community. Thus, the financial problems

> which beset education are, at least in part, another manifestation of the fundamental relationship between productivity and costs which is so critical for the living arts. (Baumol & Bowen, 1966, p. 171)

Baumol later expanded on the broader implications of this theory, including higher education. In a 1967 article entitled, "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis", Baumol observed that the challenges to urban growth and renewal centered at least in part on the fact that the costs of government services were rising faster than general costs due to the relative difficulty of increasing productivity in services associated with municipal administration.

In the same article, Baumol again postulated that the cost disease would continue to plague higher education as well:

> Higher education is another activity the demand for whose product seems to be relatively income elastic and price inelastic. Higher tuition charges undoubtedly impose serious hardships on lower-income students. But, because a college degree seems increasingly to be a necessary condition for employment in a variety of attractive occupations, most families have apparently been prepared to pay ever larger fess to institutions in recent years. As a result, higher education has been absorbing a constantly increasing proportion of per-capita income. And the relatively constant productivity of college teaching leads our model to predict that rising educational costs are no temporary phenomenon—that they are not a resultant wartime inflation which will vanish once faculty salaries are restored to their prewar levels. Rather, it suggests that, as productivity in the remainder of the economy continues to increase, costs of running the educational organizations will mount correspondingly, so that whatever the magnitude of the funds they need today, we can be reasonably certain that they will require more tomorrow, and even more on the day after that. (Baumol, 1967)

The theory of a cost disease has generated considerable controversy, and many researchers have expressed skepticism since it was proposed. Much of the early criticism within the higher education community accepted that overall costs and tuition price increases were indeed rising faster than the consumer price index, but

questioned whether this was driven by the core functions associated with the education of students. Brovender (1974) and James (1978, Spring) suggested that actual per-unit credit hour costs have not increased as rapidly as the cost disease suggests and there may indeed be true economies of scale in delivering educational services if one factors in the change in output mix associated with the allocation of time college and university faculty spend on the triad of functions, education, service, and research.

More recently, Massy (1996) has argued against the presence of a systematic cost disease, suggesting that it does not explain the preponderance of cost increases in higher education. While acknowledging that between 70% to 80% percent of college and university operating expenses are related to personnel and benefit costs, he concluded that the labor-intensive nature of higher education can only account for one percentage point above the normal growth in the CPI. He concluded that while faculty productivity gains may indeed be limited by the nature of student-faculty ratios, actual faculty personnel costs account for only 50% to 70% of educational and general expenses of a college or university budget. Since productivity gains in the United States tend to average at an annual rate of between 1 ½% and 2%, the rest of university activities should be subject to similar productivity gains (Massy, 1996).

Although focused on analyzing cost increases in government services, and not those associated with higher education, Ferris and West (1996) concluded that, while slower than the manufacturing sector, productivity increases in the labor sector were still possible. They estimated that slower productivity growth in government services accounted for two-thirds of the increased cost in government services, while the

remaining third was due to increases in real wages, based on productivity increases. Thus, some effects of a cost disease could be somewhat mitigated through real productivity increases, although these were lower than those associated with the manufacturing sector.

The theory of the cost disease, if true, has profound implications for higher education. As indicated above, in education, since the faculty-student ratio remains relatively constant, and in fact, is used as a measure of quality, the productivity growth per contact hour is often effectively zero, thus, an increase in nominal salaries for faculty will lead to an increase in the per-capita cost of providing education to students.

As described, the cost disease will affect those industries whose expenditures are disproportionately comprised of personnel costs. While it is difficult to measure the percentage of labor-related costs in higher education, it is significant: The best estimates indicate that higher education costs are disproportionately salary-driven, 5 accounting for 70% to 80% of an institution's operating budget (Massy, 1996, p. 53).

Other researchers have confirmed the importance of personnel costs in the cost structure of higher education (Brennan, 2001, p. 15; Clotfelter, 1996, 1999; Ehrenberg, 1999, 2000), often describing a compounding effect between personnel costs and the nature and structure of university goals and the pursuit of excellence as colleges and universities attempt to hire quality faculty to maintain or enhance institutional excellence, or reduce teaching loads to allow faculty to engage in important research activities.

In his assessment of cost increases in higher education, Johnstone (2001) also acknowledged that colleges and universities suffered from a general "productivity

immunity," based on their inability to successfully substitute capital for labor. Moreover, the problem of rapidly rising college costs appears to be a world-wide phenomenon, leading many governments, even those in Europe where the concept of free or low cost public education is a deeply embedded public value, to attempt to find new patterns of revenue sharing to ease pressure on public expenditures (Johnstone, 2003).

The Theory of the Cost Disease is distinct among the explanations attempting to account for cost and price issues in higher education. All other causal explanations rely on industry-specific factors unique to higher education. Cost Disease Theory offers an explanation which places cost increases in higher education as part of a broader phenomenon affecting all labor-intensive industries. The broader focus attempting to place higher education costs within the context of other service sector industries also differentiates the type of evidence used to assess the validity of Cost Disease Theory in explaining higher education costs. Unlike theories explaining cost and price increases which are higher education industry-specific, evidence relating to the existence of a cost disease requires that higher education costs must be assessed against other labor-intensive industries to determine whether and to what extent labor costs shape cost patterns in these industries. The comparison of higher education costs to costs in other labor intensive industries has yielded some very important findings, and has refocused attention on Cost Disease Theory in explaining cost and price increases in higher education (Archibald & Feldman, 2008).

While originally at the margins of the higher education cost debate, the Theory of the Cost Disease has gained tremendous currency, and is now considered one of the two

most common causes used to explain faster than-inflation increases in higher education costs, along with Bowen's Revenue Theory of Costs (Archibald & Feldman, 2008). Among single theory explanations developed to explain cost and price behavior of colleges and universities, Cost Disease Theory seems to provide the most explanatory power. While all the factors analyzed in this study are most likely associated with faster-than-inflation costs and associated price increases higher education, including the goals of non-profit institutions and the competition among institutions, there is considerable evidence that the majority of higher education cost increases are directly associated with the labor-intensive nature of the industry and the inability to easily substitute technology in the education of students without sacrificing educational quality.

After the initial studies developed by Baumol and Bowen (1965, 1966), a great deal of empirical analysis was conducted which provided additional support that labor-intensive industries are subject to a cost disease (Archibald & Feldman, 2008; Baumol, 1967, 1993; Baumol et al., 1985; Brennan, 2001; Clotfelter, 1996; Ferris & West, 1996; Johnstone, 2001, 2003). This impressive body of descriptive analysis has supplemented economic theory associated with the cost disease to provide strong evidence that disproportionately labor intensive enterprises, both profit-oriented and non-profit in their ownership structure, face cost increases that are higher than the general economy. In fact, as Clotfelter (1996) indicates, the rate of cost increases in higher education seems to mirror those associated with other professional services, even those in for-profit firms. Between 1980 and 1992, the earnings of full professors increased an at an average annual rate of 1.3% above inflation (measured by the CPI), while the salaries of non-supervisory

attorneys increased at a annual rate of 1.1% above the CPI, chief legal officers at 1.4 %, and physicians at a rate of 2.3% above the CPI (Clotfelter, 1996).

This consistent pattern can be seen in other industries, not only in the United States, but in other industrialized countries as well. Analyzing OECD data from 1960 to 1987, Baumol (1993) discovered that the growth rate of health care costs have consistently outpaced the GDP deflator index in nearly all OECD counties, independent of whether they were part of a private or public health care delivery system. Similarly, the relative price of automotive repairs and auto insurance has increased at a rate higher than the CPI, and at rates similar to those for education and health care (Baumol, 1993).

It also seems that potential issues associated with a cost disease are not limited to higher education. Examining the costs of primary and secondary education in a selected group of OECD countries, Gundlach, Wossman and Gmelin (2001) observed that low productivity growth in schooling was responsible for cost increases which exceeded inflation.

The large number of descriptive studies analyzing a variety of heavily labor-intensive industries provides the strongest support for the notion that a disproportionate percentage of higher education cost increases are directly related to its labor-intensive nature. This explanation contrasts most starkly with Bowen's Revenue Theory of Costs (1980). Bowen's theory describes the majority of higher education cost as deriving from the goals and aspirations of colleges and universities as non-profit entities, attempting to maximize quality as opposed to the more traditional goal of profit-oriented entities of maximizing profit. This would imply that large cost increases such as those observed in higher education should also be limited to other non-profit entities. However, this does

not appear to be the case. The higher rate of cost increases found in higher education seem to be found in labor-intensive profit-oriented firms as well, providing strong, empirical evidence that the single leading cause of faster-than-inflation cost increases associated with higher education is the labor-intensive nature of the industry, and not the goal structure of non-profit colleges and universities.

Literature Review – Prior Methodology

While a variety of scholars have attempted to determine whether labor-intensive industries are affected by a cost disease, very little research has been conducted specifically relating to higher education. Researchers attempting to assess the existence of a cost disease have approached the problem in innovative ways, while constrained by the data available for analysis. A series of innovative studies have been conducted comparing both worker productivity and costs in service sector jobs compared to those in the manufacturing sector. All of these prior studies have utilized time series data and trend analysis to discern the extent to which prices in labor-intensive industries follow a trajectory different from those associated with price increases in the general economy or those associated with the manufacturing sector. While not focused on education in general, these studies nonetheless have direct bearing on the issue of cost and price increases in higher education, in addition to wide-ranging implications for the general economy.

Baumol and Bowen (1965, 1966) began this analytical framework in a series of works analyzing price increases over time associated with the live performing arts, compared to salaries of performing artists. Times series analysis examining the

relationship between costs and productivity increases was later extended to examine trends in local government costs in relation to worker productivity in government service sector jobs, and the impact of stagnant productivity in government services on municipal spending pressures and the emerging urban crisis of the 1960's (Baumol, 1967).

Trend analysis has been used to analyze issues of cost increases in a variety of service sector industries and the impact of productivity growth on a number of important public policy issues. Baumol (1985) utilized the Bureau of Economic Analysis' National Income and Product Account data to assess average annual rates of productivity growth for various sectors of the economy between 1947 and 1976. Using cost and deflator index data from 1965 to 1985, Baumol (1993) analyzed increases in real educational (K-12) costs for the United States and other selected countries associated with the Organization for Economic Cooperation and Development (OECD), as well as using this method to analyze health care costs for OECD countries from 1960 to 1987. The analysis of costs in relation to productivity increases across labor sectors has provided a vital insight into the puzzle of cost and price increases in higher education, which will discussed in more detail below.

Since the effects of a cost disease are based on the limitations of leveraging technology to increase productivity in labor intensive industries, researchers assessing the effects of a cost disease have attempted to find evidence by assessing price changes across time among various industries. Increases in price should not be random; instead, those industries which are heavily labor intensive should witness substantially greater cost increases than those associated with the manufacturing sector.

Archibald and Feldman (2008) successfully utilized time series data maintained by the Bureau of Economic Analysis (BEA) National Income and Product Accounts (NIPA) to compare cost increases in higher education with other industries. As one of NIPA's datasets, the BEA has maintained price indices for 103 industries, the majority of which has been continuously collected since 1929. They used trend analysis associated with the NIPA dataset to analyze real price changes in higher education with other industries from 1949-50 to 1995-96, concluding that higher education cost rose at approximately the same relative rate as other industries in the personal services. They were, however, hampered in reaching more definitive conclusions. While NIPA data aggregates the product categories into sectors such as services, Archibald and Feldman noted that the categories utilized by NIPA did not necessarily correspond with sectors of the economy defined by cost disease theory. The Cost disease theory defined by Baumol and Bowen predicts that prices associated with labor intensive personal services should experience price increases which are higher than higher than those associated with the manufacturing sector. However, NIPA classifies goods and services in very gross categories, which do not account for the role of labor in the underlying production technology. Since they could not find a way to define product categories into exact classifications which would correspond to the role of labor in production, they determined they could not provide a statistical test to determine the significance of their analysis, which they acknowledged also limited the conclusions they could draw. However, Archibald and Feldman's approach provides another framework for assessing whether higher education costs are unique, or whether similarities exist between service sector industries.

Many of the limitations in their initial dataset noted by Archibald and Cox have been corrected in the latest 5-year revision of the NIPA classification system, completed in September, 2009. As part of a 5 year review and revision by the Bureau of Economic Analysis (BEA), the definitions associated with NIPA product categories were modified to more closely match definitions associated with durable goods, non-durable goods, and services (McCully & Teensma, 2008). This allows much more meaningful comparisons across aggregate categories defined by the BEA.

Moreover, with so few researchers conducting primary research on the effects of a cost disease specifically within higher education, it seems that an important dataset has been ignored in analyzing a relationship between a cost disease and college and university cost and tuition prices; this is the higher education price index (HEPI). HEPI was first developed in 1961, and has been collected ever since, although the method used to calculate the index was radically changed in 2002. From 1961 until 2001, the aggregated HEPI index was based on core price data for over 100 subcomponents, representing a typical market basket of goods and services consumed by colleges and universities. Beginning in 2002, the computation has been based on a regression formula, based on eight core components, which represent 79.6 percent of prior weighted HEPI index (Commonfund Institute, 2004). Deconstructing the components of the HEPI index may assist in analyzing the extent to which labor costs have influenced higher education costs, which will be discussed in more detail below.

CHAPTER III: METHODS

Conceptual Framework

This study utilizes the framework developed by Archibald and Feldman (2008), with some modifications. The study conducted by Archibald and Feldman utilized comparative price indices associated with the National Income and Product Accounts' Personal Consumption Expenditure by Product Category to compare price increases in higher education relative to other product categories. Using time series analysis, Archibald and Feldman sought to test the extent to which industries represented in the National Income and Product Accounts followed a price path similar to those associated with higher education. Rather than analyzing price rises across the entire series, they divided their dataset, spanning the years from 1949-50 through 1995-96 into 11 distinct segments of 4 years each. For each of the associated 4-year time segments, they calculated a measure of real price increases (Archibald & Feldman, 2008, p. 283).

They then calculated an "absolute difference" between the price index associated with each of the NIPA product categories and the price index for higher education for the same period. A price index which followed the same price trajectory as higher education would thus have an absolute difference of zero, while the absolute difference would become relatively greater as the differences between a particular product category and the higher education real price differed during the period under study (Archibald & Feldman, 2008).

Finally, Archibald and Feldman calculated an index reflecting the real price change for each product category from 1949-50 through 1995-96, along with a mean

absolute deviation, the mean of their calculated absolute difference, spanning the entire period from 1949-50 through 1995-96 (Archibald & Feldman, 2008).

Archibald and Feldman sorted the list of product categories by the mean absolute deviation. They noted that 18 of the top 20 product categories with the highest mean absolute deviation were services, out of a total of number of 69. Of these categories, 13 were durable goods, 17 were classified as non-durable, and 39 were services.

However, as described above, at the time they conducted their test, the NIPA classification system did not always properly categorize product categories according to the intensity of labor as a production input. They conducted a simple probability test, based on the chance that so many service product categories would randomly be associated with the highest mean absolute deviation scores. They concluded that the chance of randomly drawing 18 services among the top 20 categories experiencing the greatest price increases among a distribution containing 39 services and 30 types of other goods was .003. They concluded this was sufficient to reject their null hypothesis that those product categories containing price increases most resembling higher education would be randomly distributed (Archibald & Feldman, 2008, p. 283).

For this study, the researcher utilizes price indices in two complementary ways, in an attempt to both deconstruct cost pressures within higher education, as well as assess the extent to which higher education cost and price increases mirror those associated with other labor-intensive enterprises.

Ideally, evidence that a cost disease affects higher education should involve two distinct components; first, there should be evidence that, within higher education, personnel costs have been a significant driver of total costs. This can be done by

deconstructing higher education's industry specific price index to determine the factors most responsible college and university cost increases. The Higher Education Price Index, first established in 1961, provides valuable data to assess these industry-specific cost drivers. An analysis of this data will help determine the extent to which labor costs fuel total higher education costs over time.

However, by itself, this is insufficient. Industry-specific explanations of higher education cost can also potentially explain these increases. As described above, the Theory of a Cost Disease is the only theory attempting to explain tuition price increases based on factors which are not solely unique to institutions of higher education, but based on forces affecting all labor-intensive industries. This also implies that evidence for a Cost Disease affecting higher education should also be evident in other industries of the "stagnant" sector hypothesized by Baumol and Bowen.

Fully testing the extent to which a cost disease plagues higher education also requires a comparison of price increases in higher education relative to other industries over time to determine whether the price increases experienced in higher education mirror those associated with other labor intensive industries and, indeed, whether and to what extent there is any evidence for differences in the rate of price increases between manufacturing and labor-intensive industries.

Thus, in addition to assessing cost drivers within higher education, the researcher also analyzes higher education cost and price increases in a comparative context against other labor-intensive industries as well as manufacturing sectors of the economy. Industry-specific explanations of higher education cost and price increases focus on the distinct incentive structure facing the majority of colleges and universities as non-profit

entities. If these explanations are correct, researchers should not be able to uncover any particular pattern in price increases between different industries. However, if cost disease theory is valid, there should be discernable patterns of price behavior between labor-intensive and predominantly manufacturing based industries, whether or not the firms associated with a particular industry are profit-oriented or non-profit based entities. Moreover, researchers would also expect to find higher education price increases more closely match increases associated with other labor-intensive enterprises.

To determine the extent of a relationship between a cost disease and higher education cost increases, components of the Higher Education Price Index are used to deconstruct the cost pressures within higher education's production function to determine the extent to which labor costs are responsible for driving total industry costs. Second, the researcher utilizes national price indexes available from the National Income and Product Accounts' "Personal Consumption Expenditure by Product Category" for all available industries to compare cost and price increases in higher education to those in manufacturing and other labor-intensive industries. This provides a comparative context to determine the extent to which cost and price increases in higher education increases mirror price increases associated with other labor-intensive industries, as well as the extent to which price increases differ between industries in the manufacturing as opposed to those in the service sector. These price indices will be described later in greater detail.

A limitation acknowledged by Archibald and Feldman was their inability, due to limitations in the data, to completely isolate product categories associated with the personal services, and, thus, to provide more a robust statistical test of how cost increases in higher education corresponded to other service sector industries. While the NIPA

dataset available to them during their study did provide an aggregation for a group of activities it classifies as "services," this grouping was based on an older classification system which included some categories of services which are not truly personal services. Revisions in the classification of the Personal Consumption Expenditures dataset, completed in September 2009, have created a much more useful classification system to distinguish between durable goods, non-durable goods, and service industries, also enhancing the researcher's ability to assess the extent to which differences in price increases exist between labor-intensive and manufacturing industries.

Research Methods

This study relies on historical time series price indices to analyze the extent to which a cost disease influences cost and price increases within higher education. Two different cost and price indices, the Higher Education Price Index, created in 1961, and the National Income and Product Accounts' Personal Consumption Expenditures by Product Category will be used to determine (a) the extent to which personnel costs within higher education are responsible for driving higher education costs, and (b) the extent to which higher education cost and price increases are similar to those associated with other labor-intensive industries.

The two price indices which are used cover different timelines and are indexed to different base years. In order to provide meaningful comparative data, a decision must be made as to the proper timeframe under examination and a method to create a common, standardized index to allow analysis between indices. The higher education price index was created in 1961, and currently uses 1983 as a base year index. The Index for Personal Consumption Expenditures by Type of Product currently contains 72 detail product

categories, using 2005 as a base year. The researcher analyzes both HEPI and PCE data using a base year of 1961, the date for the creation of the Higher Education Price Index, which allows a comparative context both to analyze the extent of a relationship between labor costs and overall cost increases within higher education, as well as comparing cost and price increases in higher education to other product categories. This requires re-indexing both the HEPI and PCE data to a 1961 benchmark year, which also provides 69 detail PCE product categories. The two data sources, their uses and limitations will be discussed in further detail.

Data Sources

As described in the previous section, the researcher utilizes two distinct datasets: (a) price indices associated with the National Income and Product Accounts' Personal Consumption Expenditure by Product Category and (b) the Higher Education Price Index.

Role and Uses of Price Indexes

A price index is simply an attempt to measure changes in prices for a commodity or a market basket of goods over time. This will take into account the potential erosion of purchasing power due to inflation. For example, the most widely used price index, the Consumer Price Index, attempts to measure the average cost for a standard market basket of goods over time. For the CPI, this includes typical goods and services used by families, and includes the price of food, clothing, shelter, fuel, transportation, and the cost of medical care (Commonfund Institute, 2004, p. 3). Since the same market basket is

assessed across time, this creates an average measure of price increases over time, and thus, a measure of the inflation rate.

It is important to remember that the inflation measured by a price index differs from total increases in expenditures for a particular market basket. Expenditures are the product of the amount of items purchased times the current price. The total net price spent on a product will reflect both increases in consumption, along with any potential price increase due to inflation.

In addition to the consumer price index, a variety of different price indices have been created to determine the extent to which service and commodity prices have increased over time, including the Personal Consumption Expenditure by Product Category and the Higher Education Price Index.

Personal Consumption Expenditure by Product Category

The most comprehensive series of price indices have been maintained by the Bureau of Economic Analysis, as part of the National Income and Product Accounts (NIPA). NIPA and the Personal Consumption Expenditure indices were originally developed during the 1930's, to provide metrics to assist New Deal officials in formulating policies to cope with the Great Depression. The accounts and metrics were extended during World War II to assist government planners manage economic resources for war production (Marcuss & Kane, February, 2007).

NIPA measures changes in the Gross Domestic Product (GDP), as measured through Personal Consumption Expenditures (PCE). PCE indices measure goods and services consumed by final purchases within the US economy. This includes households, non-profit institutions serving households residing in the US, as well as purchases by the

US government. The majority of PCE purchases are comprised of new goods and services provided by private business consumed by households. In addition to quantifying how much of household income is spent on the consumption of goods and services, PCE also provides a mechanism measuring the types of goods and services purchased (Bureau of Economic Analysis, 2009).

During 2009, the Bureau of Economic Analysis conducted a comprehensive revision of the Personal Consumption Expenditure indices, creating a new classification system to more fully reflect changes in consumption patterns created by changing demographics, income and consumer preferences. The BEA wanted to also reflect the increased importance of services in consumer purchases, in addition to adding a variety of new product categories (Bureau of Economic Analysis, 2009).

Personal Consumption Expenditures by product category are now classified into the following broad categories: (a) Durable Goods, including motor vehicles, household furnishings and durable household equipment, recreational durable goods and vehicles, and other durable goods; (b) Non-Durable goods, including food and beverages purchased to be consumed outside the home, clothing, footwear, gasoline and other energy purchases; and (c) Services, which include housing and utilities, health care, transportation services, food services and accommodations, financial services and other services, including education. In addition to maintaining data on gross expenditures and quantity indices for its associated product categories, the BEA also maintains Price Indices for Personal Consumption Expenditures by Type of Product (Bureau of Economic Analysis, 2009). This series of indices for all product categories will provide

the dataset from which to compare growth in higher education costs and tuition prices to other product categories in the economy.

Higher Education Price Index

Most of the discussion focusing on rising college cost and tuition prices has centered on those increases relative to the consumer price index. However, it has long been recognized that the CPI may not be an adequate measure of costs in higher education since the market basket of goods and services utilized by the higher education community is radically different than those purchased by individual consumers. The Higher Education Price Index was created to fill this gap. HEPI was first developed by Kent Halstead beginning in 1961 as an inflation index for a market basket of goods and services purchased by colleges and universities (Hanson, 1993, p. 46).

The HEPI index measures the change in the relative price for the same bundle of goods and services over time. The market basket includes the goods and services purchased by colleges and universities through educational and general expenditures in the institution's operating budget, excluding expenditures dedicated to research. Items included in the calculation of the HEPI index include instruction, departmental research, expenditures for public service, student services, general administration expenditures, staff benefits, spending on libraries, and physical plant operation and maintenance (Commonfund Institute, 2004).

As an inflation index, HEPI provides an indictor of the minimum increases institutions of higher education require to maintain purchasing power over time. Thus, only an increase in per-unit expenditures above the adjusted inflation rate would reflect an actual increase in real resources invested in education (Commonfund Institute, 2004,

p. 1). Seen in this way, the HEPI index provides institutions of higher education a benchmark from which to assess the minimum increases required to maintain the same level of goods and services over time (Commonfund Institute, 2005, p. 8).

HEPI measures price levels using a particular year as a reference point. Currently, 1983 is used as a base year (the same base year used by the Consumer Price Index), which is assigned an index number of 100.00. The indexed value of 1 year is used to assess the relative changes in prices from the base year. For example, the HEPI index for the year 2000 was 169.9, meaning that by the year 2000, the average price of goods and services consumed by colleges and universities had increased 69.9 percent compared to 1983.

The method of calculating the HEPI index has changed over time. Between 1961 and 2001, HEPI was calculated based on price data for over 100 items purchased by colleges and universities. The components were weighted based on the relative proportion of expenditures each item represented in an average of college and universities' operating educational and general budget. For example, personnel costs comprised 74.8 percent of the total HEPI expenditure index, while contracted services, supplies and equipment comprised the remaining 25.2 percent of the index weights (Commonfund Institute, 2004).

Starting in 2002, the HEPI index has been calculated using a regression formula, based on eight of the original HEPI subcomponents. These include: (a) Faculty Salaries, (b) Administrative Salaries, (c) Clerical Salaries, (d) Service Employees, (e) Fringe Benefits, (f) Miscellaneous Services, (g) Supplies and Material, and (h) Utilities. These eight components equal 79.8 percent of the total weighted average of the all

subcomponents use in the 1990 calculation. The R-squared value of the regression model based on the eight subcomponents using the 41 observations based on the original method of calculating the HEPI index is equal to .999997809, using the 41 observations of HEPI index based on the original calculation method. This means that the HEPI values derived from the regression formula should not deviate from the calculated index by more than +/- .05 percent (Commonfund Institute, 2004, p. 18).

While the new method for calculating the HEPI index does lose some critical data since it no longer calculates many of the former HEPI subcomponents, it nevertheless still provides a useful measure of the inflationary pressures faced by colleges and universities, and the remaining sub-indices still provide useful data in deconstructing cost pressures facing institutions of higher education.

Statistical Methods

As described above, the researcher will approach this analysis in two distinct steps. This will involve utilizing historical time series HEPI and NIPA datasets to determine changes in spending patterns within higher education, utilizing the Higher Education Price Index, as well as historical NIPA data to compare higher education cost and price increases to other national product categories during the same period. Data from 1961 to 2008 are then compared (the last year data is available for both datasets).

First, the researcher deconstructed the HEPI index to determine the influence of personnel costs on higher education compared to other HEPI subcomponents. In order to do this, HEPI and its subcomponents have been re-indexed to a base year of 1961, with an assigned index value of 100.0 (currently the base year is 1983). Having completed these data transformations, the various sub-categories can be compared to determine

which components of institutional spending increased most rapidly during the period under study, influencing total costs.

This analysis utilizes descriptive statistics, including the HEPI indices themselves, and an assessment of mean increases over time. Since price indices are designed as an interval scale, relative distances in index numbers provide powerful insight into cost drivers within higher education. This analysis will attempt to answer questions associated with research sub-questions 1 through 2.

The second phase of this study involves comparing cost and price increases associated with higher education to national time series data maintained by the Bureau of Economic Analysis' Personal Consumption Expenditure by Product Category. Historical time series data also is analyzed for all 69 detail product categories maintained by the BEA since 1961.

Currently, PCE uses 2005 as a baseline year, with each indexed assigned a value of 100.0, so each of the PCE price indices has been re-indexed to the study comparison year of 1961. This provides a comparative context to assess cost and price increases in higher education since 1961 to price increases in other product categories.

The researcher compared both cost increases associated with the HEPI index as well as price increases in higher education (as one of the price indices maintained by the PCE classification) to the other PCE indices. This is particularly important for an industry such as higher education. Institutions of higher education receive revenue from multiple sources; changes in relative funding streams may also affect tuition sticker prices, which are unrelated to either the industry's production function, or the behavioral motivations of non-profit colleges and universities. Comparing both cost and price indices associated

with higher education to the price indices associated with other product categories will also highlight the differences between higher education cost increases based on intrinsic production costs to price increases which also reflect changes in sources of support.

While descriptive statistics will be analyzed including increases in mean price among the various product categories, this section will also utilize methods of inferential analysis. A key premise of cost disease theory lies in the differences between prices associated with various sectors of the economy. It is anticipated that labor-intensive industries have higher rates of cost increases than those associated with the manufacturing sector, and higher education costs and prices should be more reflective of, and to some extent, mirror these price increases. This should help prove that cost and price increases are not exclusively based on factors unique to higher education, but are instead reflective of factors associated with the industry's heavy reliance on labor inputs to produce its core product.

This requires a comparison of cost and price increases in higher education to test whether and to what extent differences occur based on industrial sector. The researcher conducted an analysis of variance comparing both cost and price increases in higher education to aggregated NIPA indices based on industrial sector. The new NIPA classification system developed in 2009 facilitates a comparison of data across these industrial sectors. Personal Consumption Expenditures are classified into three broad sectors: (a) Durable Goods, (b) Non-Durable Goods, and (c) Services. ANOVA was conducted to assess the extent to which higher education cost increases (as reflected in the HEPI index) and higher education price increases (reflected in the PCE category associated with higher education) compare to increases associated with PCE categories.

The test is designed to detect differences between two or more groups. This involved a one factor analysis of variance; the independent variable is industrial sector, with the dependent variable change in index value during the period under investigation. In this case, the null hypothesis is that the sample index values associated with the HEPI index, the Higher Education PCE and the observed indices associated with Durable Goods, Non-Durable Goods, and Services are equal. (H0: Price Increases in HEPI = Cost Increases in Higher Education PCE = Cost Increases Durable Goods PCE = Cost Increases Non-Durable Goods PCE = Cost Increases Service PCE Services.) The alternate hypothesis is that differences exist among cost increases among one or more of the measured indices.

Additionally, ANOVA post-hoc multiple comparison tests were conducted for all aggregate observations associated with the HEPI Index, Durable and Non-Durable goods, as well as Services for each year from 1961 through 2008. This was used to assess the extent to which statistical differences exist among higher education HEPI cost increases, NIPA higher education price increases, NIPA Durable good increases, NIPA Non-Durable Good price increases, and increases associated with NIPA-classified service items.

ANOVA post-hoc multiple comparison tests in which HEPI cost increases, NIPA higher education price increases, and NIPA Service Good increases are statistically different (at .05 level of significance) from price increases associated with Durable and Non-Durable Goods are considered evidence that a cost disease impacts both higher education in particular and service sector purchases more generally.

Since a core component of Cost Disease Theory indicates that price increases associated with service sector industries should outpace those associated with the manufacturing sector (represented by Durable Good purchases), while Non-Durable goods, which are generally more labor-intensive than those associated with Durable Goods but less dependent than services on labor, should also have price increases higher than those associated with the pure service sector. This test helps discern whether purchases associated with the manufacturing sector outpace those in other sectors of the economy. This provides answers to research sub-questions 3 through 5.

The ANOVA provides a quantitative measure to assess whether and to what extent differences exist between price increases in higher education and broad industrial sectors as defined by the PCE. This provides a more clinical approach in assessing the causes for higher education cost and price increases, and perhaps, more fully inform the current policy debate.

Significance and Limitations of the Study

Significance of Study

There is increasing anxiety, confusion, and growing anger over the rate of tuition price increases which have steadily outpaced increases in the consumer price index. Many in the political branches of government have been expressing growing frustration with tuition price increases, and laying the blame at institutions themselves, convinced that colleges and universities have been increasing prices beyond what is necessary, based on a misdirected sense of priorities. Defenders of higher education have often quoted variations of Cost Disease Theory as a way to explain tuition price increases, but very little work has been conducted to attempt to assess the extent to which price

increases in higher education can be explained by the existence of a Cost Disease. Studies analyzing the presence of a cost disease have been conducted for a variety of service sector industries, however, very few focused on higher education. While a recent study conducted by Archibald and Feldman (2008) attempted to assess whether higher education has experienced similar cost increases as other service sector industries, their conclusions were limited by their approach to the data, and although conducted in 2008, they limited the period under study from 1929 through 1996.

Much of the public policy discussion surrounding public financing of higher education has centered on the causes of rapidly rising tuition prices. Meanwhile, colleges and universities have been increasingly relying on adjunct labor as a way to limit costs. A better understanding of the causes of cost and price increases in higher education may assist in the public policy discussion. If faster-than-inflation costs are based on factors idiosyncratic to the higher education industry, then policy solutions centering on greater regulation and oversight may be appropriate. However, if faster-than-inflation price increases are similar to other labor intensive industries, and have been exacerbated by a relative decline in public support, this might suggest that government support should be increased. Crucial public policy choices may be affected by a better understanding of the causes for cost and price increases in higher education.

Limitations of the Study

This study has focused on the extent to which tuition price increases in higher education can be explained by the presence of a cost disease associated with the higher education production function. The study is limited by the availability of data in important ways. As originally conceived, the Higher Education Price Index was designed

as an aggregate measure of cost increases across the whole spectrum of higher education. It is a broad metric, which encompasses both private and public institutions. However, there are significant differences in the revenue streams upon which private non-profit and public institutions depend, which may impact tuition prices independent of underlying cost structures. Since public institutions are much more dependent upon public sources of support, they may be more affected by relative changes in funding sources, which may then become reflected in tuition prices. Similarly, as witnessed during the 2009-10 academic year, changes in the value of stock portfolios can significantly impact endowment income targeted to operations, which again may impact tuition prices, unrelated to the costs of providing education.

While recognizing these important differences, a study analyzing both cost drivers within higher education and comparing aggregate cost and price increases in higher education to other sectors of the economy provides useful information for current policy debates. Assessing the extent of a relationship between a cost disease and the entire higher education sector may assist future policy discussions by creating a better understanding of cost pressures which may be relatively outside institutional control to moderate, as opposed to more discretionary spending which for which institutions may be more accountable for containing.

Similarly, this research has focused on the extent to which a cost disease influences higher education costs higher education, and may be responsible for rising higher education costs and tuition prices. This does not necessarily negate research examining the complex motivations guiding the decision-making of non-profit institutions. There is a great deal of evidence that the goals of non-profit education

colleges and universities and competition among institutions for student peer-quality no doubt contribute to spending pressures. These explanations may not, in fact, be mutually exclusive, but instead could be mutually reinforcing; pressures on costs and prices arising from the institutional goals may be compounded by the nature of the costly inputs which are essential in defining measures of institutional excellence, especially reliance on relatively scarce labor which may be immune to productivity increases equal to other non-labor intensive industries. The nature of the competition for excellence may also fuel added pressures to increase institutional non-need and merit based aid as a way to leverage student 'quality', seen as vital to institutions as they attempt to maximize the peer effects of students in the their educational experience.

Future research may attempt to analyze the cost and price behavior of colleges and universities by incorporating the behavioral aspirations of colleges and universities, as well as examining intrinsic production costs based on higher education's production function. A key framework for a more fully holistic model may lie in the work conducted by Winston and his colleagues at the Williams Project on the Economics of Higher Education. Winston (1996, 2003) has developed a truly comprehensive microeconomic model of the higher education market which can help explain institutional spending and tuition pricing behavior. However, this research did not examine the effects of the Cost Disease on college and university costs, or the effects of burden shifting. Incorporating both behavioral components of college and university goals with the innate cost pressures faced by higher education as a labor intensive industry may provide greater insight into fully explaining cost and price pressures in higher education.

CHAPTER IV: RESEARCH FINDINGS

Higher Education Price Index: Integrating HEPI Data Series

As described in Chapter IV, a primary piece of evidence for the existence of a cost disease is the extent to which labor costs have driven overall costs within higher education. This requires an assessment of the changes in the higher education price index since its creation in 1961, through 2008, the last year for which complete data exists for both the Higher Education Price Index the National Income and Product Accounts dataset.

However, this offers some challenges. The calculation of the HEPI index underwent a fundamental change after 2001. Initially, the HEPI index was based on Price Data for over 100 items purchased by colleges and universities. The components were weighted based on the relative proportion of expenditures for each item represented in an average of college and universities' operating education and general budget. Personnel costs comprised 74.8 percent of the total HEPI expenditure, while the contracted services, supplies and equipment comprised the remaining 25.2 percent of the weighted index (Commonfund Institute, 2004).

Starting in 2002, the HEPI index has been calculated using a regression formula, based on eight of the original HEPI components. These include: (a) Faculty Salaries, (b) Administrative Salaries, (c) Clerical Salaries, (d) Service Employees, (e) Fringe Benefits, (f) Miscellaneous Services, (g) Supplies and Materials, and (h) Utilities. These eight components total 79.8 percent of the total weighted average of all the subcomponents used in earlier calculations. The R-squared value of the regression model using the eight subcomponents as independent variables for the 41 observations based on the original

method of calculating the HEPI index is equal to .999997809. This means that the HEPI values derived from the regression formula should not deviate from the calculated index by more than +/- .05 percent (CommonFund, 2004).

A researcher attempting to integrate the two HEPI datasets faces two challenges; first, unfortunately, most of the detail component analysis conducted by Kent Halstead, the original developer of the Higher Education Price Index, is no longer available. The researcher contacted the CommonFund Institute to request permission to use any legacy data which they might make available. The Director of the Institute was eager to provide as much assistance as possible, and released all legacy data maintained by the institute. This, however, was minimal. Fortunately, the researcher was able to cull a much more extensive dataset from prior published reports which has proved extremely useful, and can serve as a base for conducting systematic analysis of costs since 1961. This includes cost indices from 1961 through 2001 for Professional Salaries, Non-Professional Salaries, Fringe Benefits, Cost Indices for Faculty, Graduate Assistants, Executive/Public Service, Administration/Institutional Services, Library Personnel, and Supply and Equipment since 1983 (see Appendix B for initial dataset).

As stated above, the second challenge facing a researcher attempting to utilize the Higher Education Price Index is the change in calculating the index since 2001; thus, the question becomes how can the data collected between 1961 through 2001 be integrated with the HEPI index calculated since 2001 based on the eight components? Fortunately, there is a solution: part of the missing dataset can be reconstructed using a regression model, while other components can be approximated using the weighting system used in the initial calculation of the HEPI index. Each of these methods will be addressed in turn.

The pre-2002 legacy HEPI dataset contained a data series calculating the aggregate cost of contracted services, one of two primary components used in the calculation of the entire HEPI series. This is an important measure to determine the relative costs associated with Personnel and Non-Personnel components of the HEPI index, and the extent to which each may be considered a cost driver fueling higher education costs and prices.

Fortunately, there is a way to derive this information based on the information available. The current data series contains three data elements which account for 78.8 % of the weight associated with the older Contracted Services, Supplies, and Equipment data series, including Miscellaneous Services (30.6%), Supplies, and Materials (17.4%), and Utilities (30.8%). Moreover, information for these three components are available from 1961 to the present.

To calculate the index weight for Contracted Services, Supplies, and Equipment from 2002 through 2008, the researcher developed a linear regression model based on the following components: [Contracted Services, Supplies and Equipment] = [Services] + [Supplies and Materials] + [Utilities], for the time series associated with the years 1961 through 2001. In the model, [Contracted Services, Supplies and Equipment] is the dependent variable, while [Services], [Supplies and Materials], and [Utilities] are the independent variables.

The model was found to be highly significant, with an adjusted r-square value of .999, and a significance of .000. Meanwhile, each of the independent variables was also found to be significant at the .000 level (see Table 1). Using Beta values associated with the model, values for Contracted Services, Supplies, and Equipment for the period

between 2002 through 2008 will be calculated using the following formula: [Contracted Services, Supplies and Equipment] = -6.391 + .550 * [Miscellaneous Services] + .336 * [Supplies and Materials] + .164 * [Utilities]. Using this model, the data series associated with Contracted Supplies, Services, and Equipment can be extended through 2008, providing another critical piece of data in determining cost drivers within higher education between 1961 and 2008.

Table 1.

Regression Model Used to Calculate Contracted Services, Supplies and Equipment

Variables Entered/Removed

Model	Variable Entered	Variable Removed	Method
1	Utilities, Misc Services, Supplies and Materials		Enter

a. All requested variables entered

b. Dependent Variable: Total Contracted Services

Model Summary

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate
1	1.000a	.999	.999	1.2705

a. Predictors: (Constant), Utilities, Misc Services, Supplies and Materials

ANOVAb

Model		Sum of Squares	Df	Mean Squares	F	Sig
1	Regression	88555.629	3	29518.543	1.83E+04	.000a
	Residual	59.721	37	1.614		
	Total	88615.35	40			

a. Predictors: (Constant), Utilities, Misc Services, Supplies and Materials

b: Dependent Variable: Total Contracted Services

Table 1, Continued.

Regression Model Used to Calculate Contracted Services, Supplies and Equipment

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig
1	(Constant)	-6.391	.673		-9.498	.000
	Misc Services	.550	.015	.611	37.861	.000
	Supplies and Materials	.336	.028	.259	12.169	.000
	Utilities	.164	.018	.143	9.284	.000

Other pieces of the time series associated with Personnel expenditures are missing and must be reconstructed as well. This poses some additional challenges. Personnel Compensation is one of the two main components associated with the HEPI index, which was independently calculated between 1961 and 2001, along with calculations for Professional and Non-Professional Services. However, the post-2001 regression-based HEPI index discontinued the calculation of these distinct series, instead using five subcomponents associated with Personnel Expenditures as part of its regression equation. These subcomponents include: (a) Fringe Benefits, (b) Faculty Salaries, (c) Administrative Salaries, (d) Clerical and (e) Service Employees. Aggregate Personnel Compensation time series index data exists from 1961 to the present, however, faculty and administrative index data are available beginning in 1981 through 2008, while distinct index data for Clerical and Service Personnel are only available beginning in 2002.

Together, Faculty and Administrative Salaries comprise 87.5 percent of the weight attributed to Professional Salaries in the pre-regression HEPI index, while Clerical

and Service salaries comprised 62.3 percent assigned to the Non-Professional Wages index (see Table 2). Using the relative weights associated with the Pre-regression index on the available index data, the researcher recalculated the Professional and Non-Professional Salaries indexes from 2002 through 2008 based on the remaining available data series. For example, in the pre-regression HEPI index associated with Professional Salaries, Faculty Salaries were allocated a weight of 72.6 percent of the entire Professional Salaries index, while, Administrative Salaries were assigned a weight of 14.9. Since these are the only time series datasets which were calculated after the 2002 method of calculating the formula, the values associated with faculty and administrative salaries have been re-weighted based on their relative values in the pre-regression index to derive the index associated with Professional Salaries for 2002 through 2008. Similar calculations were developed to derive Non-Professional Services based on the time series associated with Clerical and Service Personnel between 2002 through 2008. While this obviously gives a slightly greater weight to faculty and administrative salaries in the calculation of professional salaries, and the Clerical and Service employee indices in the calculation of the non-professional salaries index, this should be relatively minimal since these components account for a significant weighting in the original calculation of the legacy index. (See Appendix C for enhanced HEPI dataset including Contracted Services, Supplies and Equipment, Professional and Non-Professional Salaries from 2002-2008.)

Table 2:

Percent Distribution of College and University Current Fund Educational and General Expenditures, Budget FY 1983

Weights Associated with the Higher Education Price Index			
PERSONAL COMPENATION			**77.8**
Professional Salaries		64.1	
Faculty	72.6		
Graduate Assistants	4.6		
Extension and Public Service	4.5		
Admin and inst Services	14.9		
Library	3.4		
	100.0		
Non-Professional Salaries		19.2	
Technicians	10.3		
Craftsmen	7.2		
Clerical	38.0		
Students	13.2		
Service	26.3		
Operators and laborers	7.0		
	100.0		
Fringe Benefits		16.7	
CONTRACTED SERVICES, SUPPLIES, EQUIPMENT			**25.2**
Services		30.6	
Data Processing	16.4		
Communication	16.6		
Transportation	11.5		
Printing and duplication	7.3		
Miscellaneous Services	48.2		
	100.0		
Supplies and materials		17.4	
Equipment		11.2	
Library acquisitions		10.0	
Utilities		30.8	
		100.0	

Research Question 1: What are the main cost drivers responsible for driving the Higher Education Price Index?

Table 3 displays the differences between the CPI and the HEPI Index between 1961 and 2008. The table displays annual increases in the CPI and HEPI since 1962, as well as a standardized CPI and HEPI index, which uses 1983 as a base year set to 100. As can be seen from the table, the Higher Education Price Index has increased 173.2 percent between 1983 and 2008, while the CPI has increased by a relatively lower rate of 116.7 percent within the same period of time.

Table 3:

Historical Summary of the Consumer Price Index and Higher Education Price Index
Yearly Percentage Increases, FY 1961 through FY 2008, HEPI Index 1983 - 100

Year	Yearly %		Indexes 1983 = 100		Year	Yearly %		Indexes 1983 = 100	
	CPI	HEPI	CPI	HEPI		CPI	HEPI	CPI	HEPI
1961			30.3	25.6	1985	3.9%	5.7%	107.7	110.8
1962	1.0%	3.5%	30.6	26.5	1986	2.9%	5.0%	110.8	116.3
1963	1.3%	4.2%	31.0	27.6	1987	2.3%	4.0%	113.3	120.9
1964	1.3%	3.6%	31.4	28.6	1988	4.1%	4.4%	118.0	126.2
1965	1.3%	4.2%	31.8	29.8	1989	4.7%	5.2%	123.5	132.8
1966	2.5%	4.4%	32.6	31.1	1990	4.8%	6.0%	129.4	140.8
1967	2.8%	5.8%	33.5	32.9	1991	5.4%	5.3%	136.4	148.2
1968	3.3%	6.1%	34.6	34.9	1992	3.2%	3.6%	140.8	153.5
1969	4.9%	6.3%	36.3	37.1	1993	3.1%	2.9%	145.2	157.9
1970	6.1%	6.5%	38.5	39.5	1994	2.5%	3.4%	148.8	163.3
1971	5.2%	6.6%	40.5	42.1	1995	3.0%	2.9%	153.2	168.1
1972	3.5%	5.2%	41.9	44.3	1996	2.7%	2.9%	157.4	173.0
1973	4.1%	5.4%	43.6	46.7	1997	2.9%	3.1%	161.9	178.4
1974	8.9%	6.9%	47.5	49.9	1998	1.8%	3.5%	164.8	184.7
1975	11.2%	8.8%	52.8	54.3	1999	1.7%	2.4%	167.6	189.1
1976	7.0%	6.4%	56.5	57.8	2000	2.9%	4.1%	172.5	196.9

Table 3, Continued.

Historical Summary of the Consumer Price Index and Higher Education Price Index
Yearly Percentage Increases, FY 1961 through FY 2008, HEPI Index 1983 - 100

Year	Yearly %		Indexes 1983 = 100		Year	Yearly %		Indexes 1983 = 100	
	CPI	HEPI	CPI	HEPI		CPI	HEPI	CPI	HEPI
1977	5.8%	6.4%	59.8	61.5	2001	3.4%	6.0%	178.4	208.7
1978	6.7%	6.8%	63.8	65.7	2002	1.8%	1.9%	181.6	212.7
1979	9.4%	7.3%	69.8	70.5	2003	2.1%	5.1%	185.5	223.5
1980	13.3%	9.9%	79.1	77.5	2004	2.2%	3.7%	189.6	231.7
1981	11.5%	10.7%	88.2	85.8	2005	3.0%	3.9%	195.3	240.8
1982	8.6%	9.4%	95.8	93.9	2006	3.8%	5.1%	202.7	253.1
1983	4.4%	6.5%	100.0	100.0	2007	2.6%	2.8%	208.0	260.3
1984	3.7%	4.8%	103.7	104.8	2008	3.7%	5.0%	215.7	273.2

Source: CommonFund Institute, 2009 HEPI Update

While Table 3 provides tantalizing clues about the extent of price increases in higher education compared to the consumer price index during the past five decades, more information is needed to ascertain the nature of the component increases over time. Table 4 details the nature of price changes for individual components of the Higher Education Price Index, for which continuous data have been collected sine 1983 through the present, again compared to the total HEPI and CPI indices. The CPI uses 1983 as a base year, and this standard is followed in the calculation of the HEPI index. This allows easy comparisons over time to assess changes in relative price for each of the components making up the HEPI index.

Table 4:

Consumer Price Index, Higher Education Price Index, and Major HEPI Subcomponents, 1983-2008

Year	CPI	HEPI	Personnel Components			Contracted Services, Supplies and Equipment		
			Faculty Salaries	Admin Salaries	Fringe Beneifts	Misc Services	Supplies and Materials	Utilities
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1984	103.7	104.8	104.7	104.5	108.3	104.9	99.7	102.5
1985	107.7	110.8	111.6	110.7	117.7	110.8	103.0	105.3
1986	110.8	116.3	118.4	117.7	127.7	115.1	102.6	103.1
1987	113.3	120.9	125.4	124.8	137.4	119.7	99.0	91.0
1988	118.0	126.2	131.6	129.9	147.2	123.0	101.1	87.7
1989	123.5	132.8	139.2	139.3	158.8	128.8	108.3	85.3
1990	129.4	140.8	147.7	150.6	171.4	134.0	114.3	90.1
1991	136.4	148.2	155.7	159.1	184.3	139.8	116.4	92.4
1992	140.8	153.5	161.1	163.6	194.3	145.7	115.2	93.3
1993	145.2	157.9	165.2	168.8	204.3	149.5	113.2	94.7
1994	148.8	163.3	170.1	175.6	213.6	154.8	114.3	98.7
1995	153.2	168.1	176.1	179.7	221.4	158.0	115.7	96.8
1996	157.4	173.0	181.2	188.3	224.5	163.8	130.1	93.3
1997	161.9	178.4	186.6	194.7	226.7	167.3	128.6	106.1
1998	164.8	184.7	192.9	200.9	236.7	172.8	126.2	111.1
1999	167.6	189.1	199.9	209.7	239.2	177.0	123.2	100.5
2000	172.5	196.9	207.3	219.6	254.6	182.9	123.1	104.9
2001	178.4	208.7	214.5	229.2	261.7	199.8	131.8	169.9
2002	181.6	212.7	222.7	236.4	277.1	205.8	128.2	118.1
2003	185.5	223.5	229.4	255.7	292.3	209.5	132.2	157.6
2004	189.6	231.7	234.2	263.3	312.8	216.4	135.6	176.4
2005	195.3	240.8	240.7	274.0	327.2	222.7	145.5	200.2
2006	202.7	253.1	248.2	287.7	343.7	228.8	158.1	255.7
2007	208.0	260.3	257.6	299.2	360.8	238.3	165.3	220.6
2008	215.7	273.2	268.1	314.0	380.7	246.4	180.0	252.0

Source: CommonFund Institute (2004), College and university higher education price index and CommonFund Institute (2009) 2009 HEPI Update: CommonFund Institute. Wilton CT.

Table 4 provides greater clues concerning cost drivers within higher education since 1983. As before, aggregate prices within higher education have increased 173.2

percent between 1983 and 2008, while the consumer price index has increased by 115.7 percent within the same period. However, cost increases within higher education have not been uniform. Between 1983 and 2008, costs associated with faculty salaries, which exclude benefits, have increased by 168.1 percent during the same period, which is actually slightly below increases associated with the aggregate HEPI index. Meanwhile, costs associated with Administrative Salaries have increased at an even faster rate, for an aggregate of 214 percent during the 25 years displayed in the table. However, cost increases associated with fringe benefits have far outpaced either of the salary indices, increasing by 280.7 percent between 1983 and 2008.

In contrast, costs associated with Contracted Services, Supplies, and Equipment, indices for which continuous data exist between 1983 and 2008 show a much slower pattern of growth. Miscellaneous services, while increasing faster than the CIP by 146.4 percent between 1983 and 2008, grew at a rate much lower than the aggregate HEPI index (173.2 percent). During the same period, costs associated with supplies and materials increased by only 80.0 percent, which was even lower than increases in the CPI during the same period (115.7 percent). College and University utility costs have undergone tremendous fluctuations during the period. Up until 2004, utility costs grew at a rate even below the CPI. These costs have increased substantially since 2004, increasing by 152 percent between 1983 and 2008; however, even with rapid increases in fuel prices since 2004, these costs were below those associated with the aggregate HEPI index.

Table 5:

CPI, HEPI, Professional and Non Professional Salaries, Fringe Benefits, Total Personal Compensation and Total Contracted Services, Supplies and Equipment

FY 1983 to 2008, 1983 = 100

Year	CPI	HEPI	Personal Compensation				Total Contracted Services
			Professional Salaries	Non Professional Salaries	Fringe Benefits	Total Personal Compensation	
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1984	103.7	104.8	104.7	105.1	108.3	105.4	103.0
1985	107.7	110.8	111.4	109.2	117.7	112.0	107.1
1986	110.8	116.3	118.2	112.8	127.7	118.8	109.0
1987	113.3	120.9	125.0	116.3	137.4	125.4	107.4
1988	118.0	126.2	130.9	120.6	147.2	131.7	109.8
1989	123.5	132.8	138.8	125.3	158.8	139.6	112.8
1990	129.4	140.8	147.6	130.3	171.4	148.3	118.7
1991	136.4	148.2	155.6	135.4	184.3	156.5	123.3
1992	140.8	153.5	160.8	140.2	194.3	162.4	126.9
1993	145.2	157.9	165.0	144.2	204.3	167.6	129.4
1994	148.8	163.3	170.3	148.2	213.6	173.3	133.6
1995	153.2	168.1	176.1	152.5	221.4	179.1	135.3
1996	157.4	173.0	181.7	157.3	224.5	184.1	139.9
1997	161.9	178.4	187.2	162.1	226.7	189.0	147.2
1998	164.8	184.7	193.5	168.0	236.7	195.8	151.6
1999	167.6	189.1	200.7	174.1	239.2	202.0	150.8
2000	172.5	196.9	208.4	180.4	254.6	210.8	155.8
2001	178.4	208.7	215.8	187.9	261.7	218.1	172.2
2002	181.6	212.7	225.0	198.7	277.1	228.7	169.2
2003	185.5	223.5	234.3	203.8	292.3	238.1	179.1
2004	189.6	231.7	239.2	208.9	312.8	245.6	187.1
2005	195.3	240.8	246.4	214.1	327.2	253.7	197.8
2006	202.7	253.1	254.9	219.4	343.7	262.9	214.5
2007	208.0	260.3	264.7	227.5	360.8	256.9	216.4
2008	215.7	273.2	275.3	234.7	380.7	285.1	230.9

Source: Commonfund Institute. (2004). College and university higher education price index. Wilton, CT: CommonFund Institute, and Commonfund Institute. (2009). 2009 HEPI Update: Commonfund Institute.; Professional Salaries, 2002-2008 based on weighted average of Faculty and Administrative Salaries; Non-Professional Salaries, 2002-2008 based on weighted average of Clerical and Service Employee Salaries; Total Personal Compensation based on Weighted Average of Professional, Non-Professional and Fringe Benefits; Total Contracted Services based on Regression Formula using Miscellaneous Services, Supplies and Materials, and Utilities using data from 1961-2001

Table 5 provides additional evidence for cost drivers within higher education. When fringe benefits are included, aggregated costs associated with personnel compensation increased 185 percent between 1983 and 2008, outpacing increases in the aggregate HEPI index, which increased by 173.2 percent within the same period of time, while contracted services increased at the much slower rate of 130.9 percent. Until 2004, inflation increases associated with Contracted Services actually grew at a rate lower than the Consumer Price Index, 87.1 percent, compared to the increase in the CPI of 89.6 percent during the same period. Even with rising Contracted Service Costs since 2004, increases associated with Contracted Services grew moderately faster than the CPI, with Contracted Services increasing 130.9 percent between 1983 and 2008, while the CPI increased by 115 percent during the same period. The information displayed in Table 4 indicates that, at least for the time period associated with 1983-2008, personnel costs were the main cost drivers within higher education.

There has been some concern that the period beginning in 1983 may not be representative of the nature of cost increases in higher education, especially as related to salary increases. Due to double-digit inflation in the 1970's, as measured by the CPI, which sometimes outpaced cost increases in higher education, the increases in salary during this era have been considered somewhat aberrant, and merely reflective of salary adjustments making up for lost wages during the prior decade.

To properly assess higher education cost increases before 1983, this report includes HEPI and CPI analyses as of 1961, when the HEPI index was created, using the aforementioned data integration methods. This requires that the HEPI and CPI indices, using 1983 as a base year set to 100, be re-indexed to the year 1961. (See Appendix D for re-indexed HEPI dataset, Table 6 displays some of these results.)

Table 6 provides evidence for cost drivers within higher education over a longer period of time, from 1961 through 2008. Between 1961 and 2008, the consumer price index increased 611.88 percent, while the Higher Education Price Index increased at a much faster rate, totaling 997.19 percent during the same period. However, there has been great variability in increases among the components of the Higher Education Price Index.

Both Professional and Non-Professional base salaries increased faster than the inflation as defined by the Consumer Price Index: Professional Salaries increased 859.36 percent between 1961 and 2008, while non-professional salaries increased 735.29 percent during the same period of time.

However, fringe benefits associated with both professional and non-professional salaries skyrocketed during the same period, increasing 3,907.37 percent between 1981 and 2008. When fringe benefits are factored into total personnel compensation, personnel compensation increased at a rate faster than the Higher Education Price Index, for a total of 1,022.57 percent between 1961 and 2008.

Cost associated with components of Contracted Services, Supplies, and Equipment in general increased at a much slower rate: Miscellaneous Services increased 648.94 percent between 1961 and 2008, much slower than the general HEPI index and

only slightly faster than the Consumer Price Index. Costs associated with Supplies and Materials increased 434.31 percent during the same period of time, much slower than even general inflation measured by the CPI. Between 1961 and 2008, total increases in utilities rose significantly faster than either the CPI or HEPI, for a total rate of 1,505.10 percent; however most of the faster than HEPI rate increases occurred beginning in 2001; before that time, increases in utility costs were below those associated with the Higher Education Price Index. Since 2001, utility costs have been a factor in driving total HEPI costs faster than the CPI. However, total Contracted Supplies and Equipment, including fuel costs, increased 784.82 percent between 1961 and 2008, only slightly higher than increases associated with general inflation as reflected in the Consumer Price Index, and well below increases associated with the entire HEPI index (967.19 percent).

Table 6:

Consumer Price Index, Higher Education Price Index, and Major HEPI Subcomponents, 1961-2008

			Personnel Components				Contracted Services, Supplies and Equipment			
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Total Personal Compensation	Misc Services	Supplies and Materials	Utilities	Total Contracted Services
1961	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1962	100.99	103.52	104.88	102.85	107.37	104.33	101.82	99.70	100.64	101.53
1963	102.31	107.81	110.45	105.34	116.84	109.45	103.95	99.70	100.64	102.68
1964	103.63	111.72	115.33	107.83	129.47	114.57	106.38	100.30	100.00	104.21
1965	104.95	116.41	121.60	110.32	136.84	120.08	108.81	100.90	100.00	105.75
1966	107.59	121.48	128.57	113.17	157.89	127.17	110.94	103.28	100.00	108.05
1967	110.56	128.52	139.02	117.44	176.84	135.04	114.89	105.37	100.00	110.73
1968	114.19	136.33	145.64	123.49	198.95	144.09	119.15	107.46	100.64	113.79
1969	119.80	144.92	155.40	130.25	229.47	154.33	124.32	109.25	101.27	117.62
1970	127.06	154.30	166.20	138.08	260.00	165.75	130.09	112.24	103.82	122.22
1971	133.66	164.45	174.56	148.75	294.74	176.38	137.08	116.42	114.65	130.65
1972	138.28	173.05	181.18	159.79	327.37	185.43	145.29	118.81	122.29	137.93
1973	143.89	182.42	189.20	169.40	365.26	196.06	151.67	122.69	128.66	144.06
1974	156.77	194.92	199.30	180.07	406.32	207.87	158.66	138.81	157.96	158.62
1975	174.26	212.11	210.10	194.31	451.58	221.65	172.64	173.13	202.55	185.82
1976	186.47	225.78	221.25	209.96	503.16	236.22	179.64	181.19	219.11	196.55
1977	197.36	240.23	231.36	224.56	555.79	250.00	190.27	190.45	257.96	213.41

Table 6, Continued.

Consumer Price Index, Higher Education Price Index, and Major HEPI Subcomponents, 1961-2008

			Personnel Components				Contracted Services, Supplies and Equipment			
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Total Personal Compensation	Misc Services	Supplies and Materials	Utilities	Total Contracted Services
1978	210.56	256.64	243.55	242.35	614.74	266.14	202.43	198.81	292.36	230.65
1979	230.36	275.39	258.19	261.21	678.95	285.04	216.41	214.03	320.38	249.43
1980	261.06	302.73	276.66	285.41	764.21	308.66	234.04	252.54	408.28	287.36
1981	291.09	335.16	300.70	312.10	861.05	337.80	258.97	285.37	507.64	329.12
1982	316.17	366.80	326.48	336.65	963.16	368.11	286.32	299.70	588.54	363.60
1983	330.03	390.63	348.43	355.87	1,052.63	393.70	303.95	298.51	636.94	383.14
1984	342.24	409.38	364.81	374.02	1,140.00	414.96	318.84	297.61	652.87	394.64
1985	355.45	432.81	388.15	388.61	1,238.95	440.94	336.78	307.46	670.70	410.34
1986	365.68	454.30	411.85	401.42	1,344.21	467.72	349.85	306.27	656.69	417.62
1987	373.93	472.27	435.54	413.88	1,446.32	493.70	363.83	295.52	579.62	411.49
1988	389.44	492.97	456.10	429.18	1,549.47	518.50	373.86	301.79	558.60	420.69
1989	407.59	518.75	483.62	445.91	1,671.58	549.61	391.49	323.28	543.31	432.18
1990	427.06	550.00	514.29	463.70	1,804.21	583.86	407.29	341.19	573.89	454.79
1991	450.17	578.91	542.16	481.85	1,940.00	616.14	424.92	347.46	588.54	472.41
1992	464.69	599.61	560.28	498.93	2,045.26	639.37	442.86	343.88	594.27	486.21
1993	479.21	616.80	574.91	513.17	2,150.53	659.84	454.41	337.91	603.18	495.79
1994	491.09	637.89	593.38	527.40	2,248.42	682.28	470.52	341.19	628.66	511.88
1995	505.61	656.64	613.59	542.70	2,330.53	705.12	480.24	345.37	616.56	518.39

Table 6, Continued.

Consumer Price Index, Higher Education Price Index, and Major HEPI Subcomponents, 1961-2008

			Personnel Components				Contracted Services, Supplies and Equipment			
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Total Personal Compensation	Misc Services	Supplies and Materials	Utilities	Total Contracted Services
1996	519.47	675.78	633.10	559.79	2,363.16	724.80	497.87	388.36	594.27	536.02
1997	534.32	696.88	652.26	576.87	2,386.32	744.09	508.51	383.88	675.80	563.98
1998	543.89	721.48	674.22	597.86	2,491.58	770.87	525.23	376.72	707.64	580.84
1999	553.14	738.67	699.30	619.57	2,517.89	795.28	537.99	367.76	640.13	577.78
2000	569.31	769.14	726.13	641.99	2,680.00	829.92	555.93	367.46	668.15	596.93
2001	588.78	815.23	751.92	668.68	2,754.74	858.66	607.29	393.43	1,082.17	659.77
2002	599.34	830.86	784.09	707.22	2,916.84	900.31	625.53	382.69	752.23	648.44
2003	612.21	873.05	816.35	725.41	3,076.84	937.53	636.78	394.63	1,003.82	686.21
2004	625.74	905.08	833.29	743.30	3,292.63	967.08	657.75	404.78	1,123.57	716.94
2005	644.55	940.63	858.43	761.97	3,444.21	998.72	676.90	434.33	1,275.16	757.91
2006	668.98	988.67	888.24	780.67	3,617.89	1,035.14	695.44	471.94	1,628.66	821.86
2007	686.47	1,016.80	922.24	809.70	3,797.89	1,077.17	724.32	493.43	1,405.10	829.09
2008	711.88	1,067.19	959.36	835.29	4,007.37	1,122.57	748.94	537.31	1,605.10	884.82

Source: Commonfund Institute. (2004). College and university higher education price index. Wilton, CT: CommonFund Institute, and Commonfund Institute. (2009). 2009 HEPI Update: Commonfund Institute.; Professional Salaries, 2002-2008 based on weighted average of Faculty and Administrative Salaries; Non-Professional Salaries, 2002-2008 based on weighted average of Clerical and Service Employee Salaries; Total Personal Compensation based on Weighted Average of Professional, Non-Professional and Fringe Benefits; Total Contracted Services based on Regression Formula using Miscellaneous Services, Supplies and Materials, and Utilities using data from 1961-2001. Reweighted using 1961 as base year.

Research Question 2: To what extent are labor costs driving overall costs within higher education?

Table 7 displays the aggregates for Total Personnel Compensation and Contracted Supplies and Equipment, along with the HEPI index between 1961 and 2008. When contrasted with Contracted Supplies and Equipment, it seems clear that total personnel costs, which include fringe benefits, have been the main cost driver propelling total costs within higher education (1,022.57 percent increase between 1961 and 2008), while Total Contracted Supplies and Equipment increased well below the aggregate HEPI Index (784.82 percent between 1961 and 2008). This provides important evidence that higher education is affected by a cost disease, revealing that personnel costs are a primary driver of costs within higher education. However, in order to identify the existence of a cost disease, this research must also attempt to ascertain the extent to which higher education cost and price increases are similar to other service sector industries, and the extent to which price increases associated with services in general are similar or different to those associated with the manufacturing sector. These issues will be addressed in the next sub question.

Table 7.

Consumer Price Index, Total Personal Compensation and Contracted Services, 1961-2008

Year	CPI Index	HEPI Index	Total Personal Compensation	Total Contracted Services
1961	100.00	100.00	100.00	100.00
1962	100.99	103.52	104.33	101.53
1963	102.31	107.81	109.45	102.68
1964	103.63	111.72	114.57	104.21
1965	104.95	116.41	120.08	105.75
1966	107.59	121.48	127.17	108.05
1967	110.56	128.52	135.04	110.73
1968	114.19	136.33	144.09	113.79
1969	119.80	144.92	154.33	117.62
1970	127.06	154.30	165.75	122.22
1971	133.66	164.45	176.38	130.65
1972	138.28	173.05	185.43	137.93
1973	143.89	182.42	196.06	144.06
1974	156.77	194.92	207.87	158.62
1975	174.26	212.11	221.65	185.82
1976	186.47	225.78	236.22	196.55
1977	197.36	240.23	250.00	213.41
1978	210.56	256.64	266.14	230.65
1979	230.36	275.39	285.04	249.43
1980	261.06	302.73	308.66	287.36
1981	291.09	335.16	337.80	329.12
1982	316.17	366.80	368.11	363.60
1983	330.03	390.63	393.70	383.14
1984	342.24	409.38	414.96	394.64
1985	355.45	432.81	440.94	410.34
1986	365.68	454.30	467.72	417.62
1987	373.93	472.27	493.70	411.49
1988	389.44	492.97	518.50	420.69
1989	407.59	518.75	549.61	432.18
1990	427.06	550.00	583.86	454.79
1991	450.17	578.91	616.14	472.41
1992	464.69	599.61	639.37	486.21
1993	479.21	616.80	659.84	495.79
1994	491.09	637.89	682.28	511.88
1995	505.61	656.64	705.12	518.39

Table 7, Continued.

Consumer Price Index, Total Personal Compensation and Contracted Services, 1961-2008

Year	CPI Index	HEPI Index	Total Personal Compensation	Total Contracted Services
1996	519.47	675.78	724.80	536.02
1997	534.32	696.88	744.09	563.98
1998	543.89	721.48	770.87	580.84
1999	553.14	738.67	795.28	577.78
2000	569.31	769.14	829.92	596.93
2001	588.78	815.23	858.66	659.77
2002	599.34	830.86	900.31	648.44
2003	612.21	873.05	937.53	686.21
2004	625.74	905.08	967.08	716.94
2005	644.55	940.63	998.72	757.91
2006	668.98	988.67	1,035.14	821.86
2007	686.47	1,016.80	1,077.17	829.09
2008	711.88	1,067.19	1,122.57	884.82

Source: CommonFund Institute (2004) College and university higher education price index, Wilton, CT; CommonFund Institute, and CommonFund Institute (2009).2009 HEIP Update, CommonFund Institute Personal Compensation, 2002-2008 based on weighted average of Professional and Non-Professional Salaries and Fringe Benefits; Total Contracted Services based on Regression Formula using Miscellaneous Services, Supplies and Materials and Utilities, using data from 1991-2001. Reindexed using 1961 as base year.

Research Question 3: To what extent can a cost disease explain rapidly rising costs and tuition sticker prices?

The data analyzed to answer questions 1 and 2 indicate that personnel costs are largely responsible for fueling total costs within higher education. While providing credence to the theory that higher education is affected by a cost disease, this alone is insufficient evidence to definitely conclude a cost disease impacts higher education. Cost Disease theory postulates that labor-intensive industries should experience faster-than-inflation cost increases compared to those industries which can successfully leverage

technology to increase productivity. Fully testing the extent to which higher education is impacted by a cost disease requires a comparison of price increases in higher education over time to determine whether price increases in higher education are similar to price increases associated with other labor intensive industries, and also whether there are differences between labor-intensive industries and those associated with the manufacturing sector. However, since prices in higher education may fluctuate based on shifts in support among the relative revenue streams on which higher education relies, this research also included an assessment of the extent to which changes in the higher education price index (representing intrinsic higher education production costs) are similar or different to increases associated with higher education prices, along with price increases associated with the manufacturing and labor-intensive industries.

The researcher utilized data associated with the National Income and Product Accounts Personal Consumption Expenditures Index as well as the aggregated HEPI index between 1961 and 2008 to analyze price increases among all Personal Consumption Expenditures, Durable Goods, Non-Durable Goods, Services, Higher Education Prices, and Higher Education Costs. The research sought to determine the extent to which price increases among these categories of goods and services were similar to or different from one another using ANOVA post-hoc multiple comparison tests. However, the NIPA dataset uses a base year of 2005, for which all indices are set to 100 (see Appendix E). While this research sought to analyze price increases since 1961. The NIPA dataset were transformed to set 1961 as the base year, setting all indices to 100 for the year 1961 (see Appendix F). Having recalibrated all indices using 1961 as a base

year, Appendix G displays the research database which was used to conduct the ANOVA analysis.

A one-way ANOVA analysis was conducted at a .05 level of significance, with six levels. Index Value was defined as the dependent variable, against the following levels: (a) All PCE Goods and Services, (b) Durable Goods, (c) Non-Durable Goods, (d) Services, (e) Higher Education Prices, and (f) Higher Education Costs.

The null hypothesis is that the sample index values associated with the HEPI index, the Higher Education PCE and the observed indices associated aggregate PCE Goods and Services, Durable Goods, Non-Durable Goods, and Services are equal. (H0: Price Increases in HEPI = Cost Increases in Higher Education PCE = Cost Increases Aggregate PCE Goods and Services = Cost Increases Durable Goods PCE = Cost Increases Non-Durable Goods PCE = Cost Increases Service PCE Services.) The alternate hypothesis is that differences exist among cost increases among one or more of the measured indices.

ANOVA tests whether the assumption of equal variance in the dependent variable is true by partitioning the variance into two components: the variance of the scores within the six groups under study, and the variance between the group means and the total group. Variances within groups are attributed to random fluctuations. However, variations between groups reflect both random fluctuations as well as variations based on distinct group behavior. If the null hypothesis is true, we would expect to see very little difference between the variance within groups and the variance between the groups, indicating that the observations came from similar distributed populations.

The initial ANOVA test determines the ratio of the between group variation to the within group variation; if the null hypothesis is true, the ratio of the between group variance to the within group variance would approximately equal to one. If the null hypothesis is false, the ratio of the between group variance and the within group variance should be greater than 1. The extent of the difference, based on the selected level of significance of .05, will determine whether the null hypothesis is accepted or rejected.

Table 8 reports the results from the ANOVA test statistic; the F-ratio measures the ratio between the between group variance by the within group variance. The significance level associated with the F statistic of .000 is well below the pre-determined .05 level of significance which would indicate that the null hypothesis is false, indicating that the probability that the observed difference in the ratio of the between group and within group variance would have occurred by chance if the null hypothesis is true is less than .05; in fact, the probability of obtaining an F-ratio of 19.854 with 5 degrees of freedom if the null hypothesis is true is less than 1 chance in 1000. This suggests a high degree of confidence that the null hypothesis, assuming that Price Increases in HEPI = Cost Increases in Higher Education PCE = Cost Increases Aggregate PCE Goods and Services = Cost Increases Durable Goods PCE = Cost Increases Non-Durable Goods PCE = Cost Increases Service PCE Services, can be rejected, while the alternate hypothesis can be accepted. This indicates that price increases associated with at least one of the price indices tested is significantly different from some of the others.

Table 8.

ANOVA Analysis: All PCE Goods and Services, Durable Goods, Non-Durable Goods, Services, Higher Education Prices, and Higher Education Costs

Index	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.051E+07	5	210193.79	19.854	.000
Within Groups	2.986E+07	282	105872.56		
Total	4.037E+07	287			

However, an additional challenge remains: while the F-statistic provided information that at least one of the tested indices differs from others, it did not provide details on which price measures of the six investigated differ. This requires running an additional corollary test – the Post-Hoc Multiple Comparison Test to determine which of the six indices included in the ANOVA analysis differ from one another.

The Tukey Post-Hoc Multiple Comparison Test assesses all two-way (pairwise) comparisons based on the pre-determined significance level (for this analysis, determined to be .05). In this case, the null hypothesis tests 15 individual pairwise comparisons; each of these pairwise comparisons is analyzed below.

1) Price Increases All PCE Goods and Services = Price Increases PCE Durable Goods;

2) Price Increases All PCE Goods and Services = Price Increases PCE Non-Durable Goods;

3) Price Increases All PCE Goods and Services = Price Increases PCE Services;

4) Price Increases All PCE Goods and Services = Higher Education Price Increases;

5) Price Increases All PCE Goods and Services = Higher Education Cost Increases;

6) Price Increases PCE Durable Goods = Price Increases PCE Non-Durable Goods;

7) Price Increases PCE Durable Goods = Price Increases PCE Services;

8) Price Increases PCE Durable Goods = Higher Education Price Increases;

9) Price Increases PCE Durable Goods = Higher Education Cost Increases;

10) Price Increases PCE Non-Durable Goods = Price Increases PCE Services;

11) Price Increases PCE Non-Durable Goods = Higher Education Price Increases;

12) Price Increases PCE Non-Durable Goods = Higher Education Cost Increases;

13) Price Increases PCE Services = Higher Education Price Increases;

14) Price Increases PCE Services = Higher Education Cost Increases;

15) Higher Education Cost Increases = Higher Education Price Increases;

The Tukey Post-Hoc Multiple Comparison Test uses the Q-Statistic to determine whether the differences between pairwise comparisons differ so much that the null hypothesis should be rejected. The Q-statistic calculates the differences between group means; if the mean pairwise difference is high enough, the null hypothesis assuming the two values associated with the pairwise value can be rejected, otherwise it is not rejected.

Table 9.

Results of Post Hoc Multiple Comparison Test

Index Tukey HSD	Multiple Comparisons				95% Confidence Interval	
(I) Item Code	(J) Item Code	Mean Difference (I-J)	Std. Error	Sig	Lower Bound	Upper Bound
All PCE Goods and Services	Durable Goods	60.579313	6.6418E+01	.943	-130.00216	251.16078
	Non-Durable Goods	-38.093133	6.6418E+01	.993	-228.67460	152.48834
	Services	-137.471487	6.6418E+01	.306	-328.05296	53.10998
	Higher Education Prices	-517.327675*	6.6418E+01	.000	-707.90915	-326.7462
	Higher Education Costs	-219.866161*	6.6418E+01	.013	-410.44763	-29.28469
Durable Goods	All PCE Goods and Services	-60.579313	6.6418E+01	.943	251.16078	-130.00216

Table 9, Continued.

Results of Post Hoc Multiple Comparison Test

Index Tukey HSD	Multiple Comparisons				95% Confidence Interval	
	Non-Durable Goods	-98.672446	6.6418E+01	.674	-289.25392	91.90903
	Services	-198.050800*	6.6418E+01	.036	-388.63227	-7.46933
	Higher Education Prices	-577.906988*	6.6418E+01	.000	-768.48846	-387.32552
	Higher Education Costs	-280.445474*	6.6418E+01	.000	-471.02695	-89.86400
Non-Durable Goods	All PCE Goods and Services	38.093133	6.6418E+01	.993	-152.48834	228.67460
	Durable Goods	98.672446	6.6418E+01	.674	-91.90903	289.25392
	Services	-99.378354	6.6418E+01	.667	-289.95983	91.20312
	Higher Education Prices	-479.234542*	6.6418E+01	.000	-669.81601	-288.65307
	Higher Education Costs	-181.773028	6.6418E+01	.071	-372.35450	8.80844
Services	All PCE Goods and Services	137.471487	6.6418E+01	.306	-53.10998	328.05296
	Durable Goods	198.050800*	6.6418E+01	.036	7.46933	388.63227
	Non-Durable Goods	99.378354	6.6418E+01	.667	-91.20312	289.95983
	Higher Education Prices	-379.856188*	6.6418E+01	.000	-570.43766	-189.27472
	Higher Education Costs	-82.394674	6.6418E+01	.816	-272.97615	108.18680
Higher Education Prices	All PCE Goods and Services	219.866161*	6.6418E+01	.000	326.74620	707.90915
	Durable Goods	577.906988*	6.6418E+01	.000	387.32552	768.48846
	Non-Durable Goods	479.234542*	6.6418E+01	.000	288.65307	669.81601
	Services	379.856188*	6.6418E+01	.000	189.27472	570.43766
	Higher Education Costs	297.461515	6.6418E+01	.000	106.88004	488.04299
Higher Education Costs	All PCE Goods and Services	219.866161*	6.6418E+01	.013	29.28469	410.44763
	Durable Goods	280.445474*	6.6418E+01	.000	89.86400	471.02695

Table 9, Continued.

Results of Post Hoc Multiple Comparison Test

Index Tukey HSD	Multiple Comparisons			95% Confidence Interval	
	Non-Durable Goods	-181.773028	6.6418E+01	.071	-8.80844	372.35450
	Services	82.394674	6.6418E+01	.816	-108.18680	272.97615
	Higher Education Prices	-297.461515*	6.6418E+01	.000	-488.04299	-106.88004

* The mean difference is significant at the .05 level.

Table 9 details the pairwise comparisons analyzed using the Tukey Post-Hoc Comparison Test, and provides key results to assess first, the extent to which a cost disease can explain higher education cost and prices, as well as whether differences exist in the rate of price increases between aggregate PCE Product and Services, Durable Goods, Non-Durable Goods, and Services. The results among these components provide additional information on the extent to which price increases in service sector purchases differ from those associated with durable and non-durable goods, and ultimately, whether a general cost disease impacts the service sector as well. As indicated, 15 distinct pairwise comparisons were conducted using the Tukey Post-Hoc Comparison Test. Each of these comparisons will be assessed in detail.

Price increases all PCE goods and services = price increases PCE durable goods.

The mean difference between price increases associated with PCE Goods and Services and PCE Durable goods is 60.579; this is associated with a significance level of .943. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining an approximate mean difference through chance alone is so high (over 94 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests price

increases associated with All PCE Goods and Services and PCE Durable Goods are not significantly different.

Price Increases all PCE goods and services = price increases PCE non-durable goods.

The mean difference between price increases associated with PCE Goods and Services and PCE Non-Durable goods is -38..93; this is associated with a significance level of .993. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining an approximate mean difference through chance alone is so high (in this case over 99 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests that price increases associated with All PCE Goods and Services and PCE Non-Durable Goods are not significantly different.

price increases all PCE goods and services = price increases PCE services.

The mean difference between price increases associated with PCE Goods and Services and PCE Services -137.471; this is associated with a significance level of .306. Since the chance of obtaining an approximate mean difference based on chance alone is still extremely high (30.6 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests that price increases associated with All PCE Goods and Services and those Associated with PCE Services are not significantly different.

price increases all PCE goods and services = higher education price increases.

The mean difference between price increases associated with PCE Goods and Services and Higher Education Price Increases is -517.327. This is associated with a significance level of .000. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that price increases associated with Higher Education are significantly greater than general price increases associated with all PCE Goods and Services.

price increases all PCE goods and services = higher education cost increases.

The mean difference between price increases associated with PCE Goods and Services and Higher Education Cost Increases is -219.867. This is associated with a significance level of .013. Since the chance of obtaining the same mean difference through chance alone is extremely low (13 out of 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that cost increases associated with Higher Education are significantly greater than general price increases associated with all PCE Goods and Services.

price increases PCE durable goods = price increases PCE non-durable goods.

The mean difference between price increases associated with PCE Durable Goods and Non-Durable Goods is – 98.672. This is associated with a significance level of .674. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining an approximate mean difference through chance alone is extremely high (67.4 percent), the null hypothesis

assuming these come from the same distribution is not rejected. This suggests that price increases associated with PCE Durable Goods and those associated with PCE Non-Durable Goods are not significantly different.

price increases PCE durable goods = price increases PCE services.

The mean difference between price increases associated with PCE Durable Goods and PCE Services is -.198.051. This is associated with a significance level of .036. This is below the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (3.6 percent), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that price increases associated with PCE Services are significantly higher than those associated with PCE Durable Goods.

price increases PCE durable goods = higher education price increases.

The mean difference between price increases associated with PCE Durable Goods and Higher Education Price Increases is -577.907. This is associated with a significance level of .000. This is well below the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that price increases associated with Higher Education are significantly greater than price increases associated with PCE Durable Goods.

price increases PCE durable goods = higher education cost increases.

The mean difference between price increases associated with PCE Durable Goods and Higher Education Cost Increases is -280.445. This is associated with a significance level of .000. This is well below the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that cost increases associated with Higher Education are significantly greater than price increases associated with PCE Durable Goods.

price increases PCE non-durable goods = price increases PCE services.

The mean difference between price increases associated with PCE Non-Durable Goods and PCE Services -99.379. This is associated with a significance level of .667. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining a similar mean difference through chance alone is so high (over 67 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests that price increases associated with PCE Non-Durable Goods and PCE Services are not significantly different.

price increases PCE non-durable goods = higher education price increases.

The mean difference between price increases associated with PCE Non-Durable Goods and Higher Education Price Increases is -479.234. This is associated with a significance level of .000. This is well below the .05 level of significance under which it

was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that price increases associated with Higher Education are significantly higher than even those associated PCE Non-Durable Goods.

price increases PCE non-durable goods = higher education cost increases.

The mean difference between price increases associated with PCE Non-Durable Goods and Higher Education Cost Increases is -181.773. This is associated with a significance level of .306. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining an approximate mean difference through chance alone is extremely high (nearly 31 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests that price increases associated with PCE Non-Durable Goods and those associated with Higher Education Costs are not significantly different.

price increases PCE services = higher education price increases.

The mean difference between price increases associated with PCE Services and Higher Education Price Increases is –379.856. This is associated with a significance level of .000. This is well below the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This

suggests that price increases associated with Higher Education are significantly higher than even those associated PCE Services.

price increases PCE services = higher education cost increases.

The mean difference between price increases associated with PCE Services and Higher Education Cost Increases is -82.395. This is associated with a significance level of .816. This is well above the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining a similar mean difference through chance alone is so high (nearly 82 percent), the null hypothesis assuming these come from the same distribution is not rejected. This suggests that price increases associated with PCE Services and Higher Education Cost Increases are not significantly different.

higher education cost increases = higher education price increases.

The mean difference between price increases associated with PCE Services and Higher Education Price Increases is –297.46. This is associated with a significance level of .000. This is well below the .05 level of significance under which it was determined the null hypothesis should be rejected. Since the chance of obtaining the same mean difference through chance alone is extremely low (less than 1 chance in 1000), the null hypothesis assuming these come from the same distribution can be rejected. This suggests that price increases associated with Higher Education are significantly higher than higher education cost increases.

Analysis of the post-hoc comparison tests provides some mixed answers to question 3: To what extent can a cost disease explain rapidly rising tuition sticker prices? Three of

the post-hoc comparison tests provide information to answer this question: (a) the relationship between PCE Services to Higher Education Prices (Post-hoc analysis question (b) the relationship between PCE Services to Higher Education Costs, and (c) The relationship between higher education costs and higher education price increases. The theory of a cost disease would suggest that while the prices of services should be higher than those associated with the manufacturing sector, the cost and prices of services should be comparable to one another. It is here that the analysis provides some mixed results.

A comparison of higher education cost increases to those associated with the service sector reveals no significant differences in the rate of increase between these two categories. The mean difference of -.82.39 was associated with a significance level of .816. The chance of obtaining similar results based on chance alone is so high that the null hypothesis cannot be rejected. This does suggest that there is no statistical difference between higher education cost increases and price increases associated with PCE Services. This would lend support to the idea that a cost disease impacts higher education.

However, the mean difference between price general PCE Services and higher education price increases was -379.856, which was associated with a significance level of .000. The chance of obtaining a similar result based on chance alone is less than 1 in 10,000, leading to a rejection of the null hypothesis that both came from similar distributions. This supports the idea that higher education prices have been increasing at a rate faster than general PCE Services.

Similarly, a comparison of higher education costs and higher education prices yields a mean difference of -297.461, also significant at the .000 level of significance. This suggests that higher education prices have been rising much faster than higher education costs.

The decision to analyze both higher education cost as well as price increases stems from the impact which shifting revenue streams may have upon higher education prices, independent of cost pressures facing higher education; this is the potential problem associated with burden shifting, discussed earlier. If non-tuition revenue streams fail to keep pace with costs, tuition revenue may be used to fill the gap. This may help to explain the different results when analyzing higher education cost and price increases compared to general services represented by PCE Services. The results indicate that higher education costs have not been rising significantly faster than prices associated with the service sector, which would indicate that a cost disease impacts higher education, whose impact does not appreciably differ from those associated with other services. However, higher education prices have been rising significantly faster than the service sector, and indeed, significantly faster than higher education costs. The possible reasons for this will be explored more fully in Chapter 5.

Research Question 4: Are there similarities between increases in higher education costs and tuition sticker prices and prices in other labor intensive industries?

The research findings described above provide tantalizing evidence concerning the relation of higher education cost and price increase relative to other service sector consumption categories. A comparison of Services and higher education costs indicate

comparable rates of increases. The mean difference between the two data series was -82.395, which was associated with a .816 level of significance; the chance of obtaining a similar mean difference due to chance alone is so high that the null hypothesis could not be rejected. This suggests that higher education cost increases are similar to price increases associated with a composite of all Services maintained in the National Income and Product Accounts Personal Consumption Expenditures Index.

While higher education cost increases are similar to those of Services, price increases associated with higher education far outpaced price increases in the PCE Service index. The mean difference between price increases associated with aggregate Services in the Personal Consumption Expenditure Index and Higher Education Price Increases is – 379.856, which was associated with a significance level of .000. The chances of obtaining similar results based on chance are so low (less than 1 in 10,000) that the null hypothesis, assuming these indices came from the same distribution, could be rejected. This indicates that higher education costs are rising much faster than prices associated with all Services in the PCE Index.

Even a comparison of the rate of cost increases in higher education to aggregate price increases reveals that higher education prices are rising much faster than higher education costs. The mean difference between price increases associated with PCE Services and Higher Education Price increases is –297.46. This is associated with a significance level of .000, which again indicates a rare occurrence with very little probability the outcomes were random.

A key principle of Cost Disease theory suggests that since it harder to leverage labor saving technology in the service sector compared to the manufacturing sector, the

intrinsic production costs associated with services will rise more rapidly than those associated with the manufacturing sector, which will also be reflected in the relatively faster rate of price increases associated with service sector. While higher education costs have increased at a rate comparable to other services, higher education prices have far outpaced increases in services, as well as increases in higher education prices. The dissonance witnessed in the behavior between higher education costs and prices, in relation to one another as well as the service sector will be explored more fully in Chapter V.

Research Question 5: Are there differences between price increases in labor intensive industries compared to those associated with the manufacturing sector?

Answers to this research question are based on the relationship between aggregate Services reflected in the PCE Services Index, PCE Non-Durable Goods, and PCE Durable Goods, and would also help discover whether a cost disease impacts the service sector. According to cost disease theory, due to the inability to leverage labor-saving technology in the service sector as compared to the manufacturing sector, prices should rise faster in services relative to manufacturing. As far as the categories of products and services are concerned, this would mean that researchers would expect to see price increases in services outpace those associated with durable goods, the primary product of the manufacturing sector.

There does indeed seem to be differences in the rate of price increases between Durable Goods and Services associated with the Personal Consumption Expenditure Index. The mean difference between price increases associated with Durable Goods and Services was -.198.051; this is associated with a significance level of .036, which is

below the .05 level of significance under which it was determined the null hypothesis should be rejected. The rate of price increases associated with services is significantly higher than those associated with durable goods, primary evidence that a cost disease does in fact impact Service-related jobs.

Theory is less clear on the precise relationship between prices in the Services and those associated with Non-Durable Goods. Non-Durable Goods include purchases on items such as food and alcohol purchased for the home, clothing, personal care products, and magazine and newspapers. In principle, researchers should expect to find that the more labor intensive the task, the faster price increases associated with the particular product category. However, unlike durable goods which are heavily associated with the manufacturing sector, Non-Durable goods encompass a strong labor component.

The mean difference between price increases associated with PCE Durable Goods and Non-Durable Goods is – 98.672, which is associated with a significance level of .674. Since obtaining results equal to this due to chance alone would be extremely common, the null hypothesis was not rejected. While the mean difference indicates that durable good prices were slightly lower than those associated with non-durable goods, the difference was simply not significant. There seems to be very little difference in price increases between durable and non-durable goods.

Similarly, there was no statistical difference in the rate of price increases between non-durable goods and services. The mean difference was -99.378, which was associated with a significance level of .667. While suggesting that services increased at a faster rate than non-durable goods, the chance that the results were due to chance are so high the

null-hypothesis was rejected. There is no significant difference between the rate of price increases associated with non-durable goods and services.

In conclusion, the results discussed in this section do seem to indicate the presence of a cost disease associated with the service sector; a primary postulate of cost disease theory states that, since labor is incidental to the production of goods and services, and central to the output of service sector jobs, costs associated with services will rise faster than those associated with the manufacturing sector. The research results analyzed in this chapter strongly support this theory.

CHAPTER V: CONCLUSION

The Cost Disease and Higher Education: Evidence from Research Findings

The research conducted for this study has revealed compelling evidence that a cost disease impacts higher education. Determining whether and to what extent higher education is affected by a cost disease necessitated two complementary methods of inquiry, involving an analysis of cost pressures within higher education as well as a comparative analysis of higher education cost and prices against other industries and sectors.

First, components of the higher education price index were deconstructed to isolate the relative impact that personnel and non-personnel related expenditures have had on the trajectory of higher education costs from 1961 through 2008. Following this, higher education cost and prices were compared to increases associated with other aggregate sectors of the economy, including Durable Goods, Non-Durable Goods, and Services.

The analysis of higher education costs between 1961 and 2008 revealed that personnel costs were the main driver of total college and university costs. Between 1961 and 2008, the Consumer Price Index increased 611.88 percent, while the higher education price index increased by 967.19 percent. However, costs associated with personnel and non-personnel categories increased at very different rates, with total Contracted Services increasing 784.82 percent (moderately faster than the CPI during the same period, and much slower than the aggregate HEPI increase of 967.19 percent), while total Personal

Compensation increased much more dramatically, for a total of 1022.57 percent between 1961 and 2008. This clearly demonstrates that personnel costs have been the main cost driver of total costs in higher education since 1961.

An analysis of higher education costs and price increases to price increases associated with other sectors of the economy also provides strong evidence to determine that a cost disease impacts higher education. In order to determine whether a cost disease impacts higher education, three of the most important comparisons involved assessing higher education cost increases to the rate of price increases associated with PCE Services and PCE Durable Goods, and more generally, PCE Services with PCE Durable Goods. The theory of a cost disease suggests that cost and price increases associated with service-related industries will be higher than those associated with the manufacturing sector, since it is harder to leverage technology to increase productivity in service sector compared to manufacturing-related industries.

Based on theory, researchers should expect that the prices associated with services should rise faster than those associated with the manufacturing sector, represented in the data set as Durable Goods. The analysis of the results strongly supports the presence of a cost disease impacting the services in general, and higher education in particular.

Using the Tukey Post-Hoc Multiple Comparison Test, the mean difference between price increases associated with PCE Durable Goods and PCE Services was -198.51, which was associated with a significance level of .036. This was below the .05 level of significance under which it was determined the null hypothesis should be rejected, and suggests that price increases among the aggregated Services associated with the NIPA PCE index are significantly higher than those associated with PCE Durable

Goods. This finding reveals that a general cost disease impacts the services relative to the manufacturing sector, and provides an important proof of the first component of cost disease theory.

However, in addition to assessing the extent to which a cost disease impacts the services generally, this study also attempted to determine the extent to which a cost disease impacts higher education in particular. This required comparing higher education cost and price increases to those in associated with the Services.

As described in the literature review, many of the competing theories attempting to explain higher education cost and price increases stress the unique role that the non-profit status of the majority of colleges and universities has in propelling costs based on competition for prestige and excellence. Indeed, most stress the impact of these factors as driving costs associated with higher education's production function. If that is true, researchers would expect to find that higher education costs and prices would increase at rates significantly faster than those associated with other services, especially those industries with profit-oriented firms.

However, Cost Disease theory suggests that cost and price increases associated with the services should be similar, irrespective of the ownership structure associated with a particular industry. Thus, to determine how well cost disease theory explains higher education cost and price increases, higher education costs and prices were compared against price increases in the Services. As described in the methodology section, since higher education relies on multiple funding streams which can change over time and which may impact tuition charges independent of changes in costs, it was

determined to compare both higher education costs and prices to price increases associated with the service sector.

These findings also strongly support the idea that a cost disease impacts higher education. Using the Tukey Post-Hoc Multiple Comparison Test, the mean difference between price increases associated with PCE Services and Higher Education Cost Increases was -82.395, which was associated with a .816 level of significance. This was well above the .05 level of significance under which it was determined that the null hypothesis should be rejected, and suggests there is no statistical difference between cost increases associated with higher education and price increases among the Service sector. This finding reveals that, contrary to theories stressing idiosyncratic factors in fueling higher intrinsic production costs, it seems higher education costs are more reflective of a wider cost disease which impacts all services. This provides strong support for the theory that the cost disease is primarily responsible for increasing higher education costs.

Theoretical Implications of the Research

The research associated with attempting to determine the extent to which a cost disease impacts higher education costs and prices has important theoretical implications, not only for public policy associated with higher education in particular, but also more broadly with federal and state public finance. First, a cost disease associated with higher education strongly suggests that higher education costs will continue to increase faster than the rate of inflation as measured by the Consumer Price Index. Far from being the anomalous result of the pursuit of excellence propelled by competition for prestige among non-profit colleges and universities, the results suggest that higher education costs are shaped by more general forces impacting the entire service sector. The inability to

leverage technology to increase productivity as fast as that associated with the manufacturing sector will mean that higher education will face intrinsic cost increases which outpace those associated with the general economy. This is not independent of the ownership structure associated with college and universities, and related to higher education's production function; its heavy reliance on labor as a key input in its production process.

The cost disease in higher education has important implications associated with the nature and extent of productivity increases which are possible among institutions of education, and how these should be pursued. Moreover, since a cost disease implies that college costs will outpace the rate of general inflation, the impact of a cost disease has important implications for higher education finance. A cost disease affecting colleges and universities implies that state and federal support for higher education should increase at least as fast as the increases in the higher education price index on a per-capita student basis. However, rapidly rising college costs threatens student access to higher education, and impacts the mix of public and private resources used to finance a student's education, including the relative mix of public versus private support, and even the current method of providing loans to students and families. These policy implications will be explored in more detail in the sections below.

In assessing the extent that a cost disease impacts higher education, the research findings also determined that the Services are also impacted by a general cost disease. This has important implications for public finance. A general cost disease suggests that the cost of services will increase faster than those associated with the manufacturing sector. Since the majority of local, state, and federal programs support the provision of

services, this strongly suggests that the cost of government programs will increase faster than those associated with the general inflation rate.

This strongly suggests that the states and the federal government will face continuing difficulty in raising revenue to support critical social programs even during periods of relative prosperity, resulting in difficult resource allocation decisions in budgeting among a variety of competing social claims. Determining the proper mix of government services also implies that we face possible contentious social choices related to the relative allocation of the economy between the public and private sector, which may require increases in taxes to support the level of government services which are deemed socially beneficial. The implications of a general cost disease on state and local government finance will be also be explored in more detail in the sections below.

Increases in Higher Education Prices relative to Costs

One of the potentially puzzling research results revealed in Chapter IV indicated that while the rate of higher education cost increases was not statistically different from increases associated with Services, the rate of increases associated with higher education tuition sticker prices were significantly higher than those associated with Services. The question remains why? The literature review identified two causes as most likely: burden shifting and the growing reliance on tuition discounting as a way to target aid to highly sought-after students. In fact, assessing the factors associated with undergraduate tuition price increases is surprisingly difficult: colleges, even small ones, are multi-product firms

with multiple revenue streams, in which some "product lines" can be used to subsidize others.

However, there does seem to be evidence that burden shifting has occurred in a variety of important funding streams, beginning with the Federal Pell Grant. In fiscal year 1976, the maximum Pell Grant was set at $1,400, which on average could pay for 72 percent of the cost of attending a Public 4-year institution, and 35 percent of a private 4-year college. By academic year 2006-07, the maximum Pell Grant was set at $4,050, which by then could only pay for 32 percent of the average cost of a public 4-year college, and only 13 percent of the average cost of tuition at a private 4 year college (American Council on Higher Education, 2006). Moreover, the adjusted constant value of the Pell Grant has not even kept pace with the general rate of inflation: the adjusted value of the maximum Pell Grant awarded in AY 1976-77 in constant 2006 dollars would be equivalent to $4,732, while the actual maximum Pell Grant available to students during AY 2006-07 was $ 4,050 (American Council on Higher Education, 2006). The $4,732 figure is needed merely to keep up with inflation since 1976. If the Pell Grant was adjusted to match true cost increases facing higher education based on the Higher Education Price Index, the maximum Pell Grant for the Academic 2006-07 fiscal year would have been $6,130 (calculation based on HEPI Index.) So, not only has the maximum Pell Grant kept up with higher education costs associated with the HEPI, it has failed to even kept pace with general inflation. This does suggest that, at least as it relates to federal need-based student assistance, one of the causes for rapidly rising tuition prices is burden shifting.

However, the bulk of public funding for higher education comes from state budget allocations. Here the data suggests there may be more complex forces at work: Fairly significant shifts in funding depending on tax revenues resulting in fairly significant fluctuations in the proportion of funding derived from tuition sources over time.

Between 2002-03 and 2006-07, federal, state and local appropriations for public degree granting institutions increased from $63.2 billion $73.9 billion in current dollars, an increase of 17 percent (Table 352 Snyder & Dillow, 2010b); however, due to enrollment growth, this translated to a per-student allocation of $ 6,840 in 2002-03 to $7,780 in 2006-07, a per-student increase in current dollars of 13.7 percent (Table 352 Snyder & Dillow, 2010b). Meanwhile, between FY 2002 and 2006, the higher education price index increased 17.1 percent, while the CPI increased by 11.6 percent during the same period (based on HEPI Index). So while total public appropriations mirrored increases associated with the Higher Education Price Index, public support failed to keep pace with higher education costs on a per-capita student basis. This is a clear indication that burden shifting occurred. Even during this relatively brief period, there were fluctuations in the percentage of costs supported by tuition; tuition and fees accounted for 15.84 percent of operating revenues during the 2003-04 academic year, increasing to 16.97 percent of operating costs by AY 2005-06 (Table 352 Snyder & Dillow, 2010b). The relative proportion of operating revenue provided by Tuition and fees actually decreased to 16.67 during AY 2006-07 (Table 353 Snyder & Dillow, 2010c). Even with these fluctuations, there does seem to be an overall trend on greater reliance on tuition

and fees over time; in 1980-81, tuition and fees accounted for 12.9 percent (Table 337 Snyder & Dillow, 2010a).

A similar pattern emerges when examining the proportion of revenue derived from tuition for private non-profit institutions. When examining the period between AY 1997-98 through AY 2006-07, the proportion of revenue derived from tuition and fees has declined, from an average of 27.82 percent from AY 1997-98 to an average of 26.03 percent in 2006-07 for all institutions. However, this masks large shifts based on the investment returns associated with non-profit endowments. During AY 2001-02 and 2002-03, net endowment losses led to increased reliance on tuition and fees, from 38.1 percent of total non-profit revenue in AY 2001-02 to 39.72 percent of total non-profit revenue in AY 2002-03, representing a large percentage increase in tuition and fees for those institutions relying on endowments to offset tuition increases (Table 355 Snyder & Dillow, 2010d).

A major problem associated with burden shifting is that it often occurs during periods of economic strain and higher unemployment, resulting in declining state income and sales tax revenue, or the declining value of portfolios associated with non-profit institutions.

These shifts create an even greater burden on students and families precisely when many students and families are hardest hit by economic forces beyond their control. During these periods, when access to advanced education may serve as an effective and relatively low-cost medium-term state and federal employment enhancement policy, students are faced with an ever more imposing barrier to entry, involving

disproportionate increase in tuition relative to price increases associated with the rest of the economy.

Tuition Discounting

The practice of tuition discounting also seems to be partially responsible for escalating tuition sticker prices, particularly at private colleges. Using a sample of institutions over time, the College Board estimated that the total undergraduate discount rate among all sectors of higher education has increased between 1994-95 and 2004-05; the discount rate for public 2-year institutions increased from 6.8 percent in 1994-95 to 12.5 percent in 2003-04 (a small sample size produced non-reportable results for the 2004-05 year); for public 4 year colleges, the discount rate increased from 11.7 percent during the 1994-95 academic year to 14.7 percent by 2004-05. Meanwhile, discounting was most prevalent at private 4 year colleges, with a discount rate of 23.8 percent during the 1994-05 academic year, increasing to 33.5 percent by 2004-05 (Baum & Lapovsky, 2006). However, even these statistics may mask the growing reliance on tuition discounting: the even faster rate of discounting associated with the entering freshman cohort over time. According to an annual study conducted by the National Association of Business Officers, the average discount rate for first-time, full-time freshman increased from 27 percent in 1990 to 39 percent in 2002. Beginning in 2002, the average discount rate remained around 38 percent. However, since then the discount rate climbed again from 39.1 percent in the fall 2007 to 41.8 percent in fall 2008 (Fain, 2010). Meanwhile, only 12 percent of the aid awarded as institutional grants was supported through endowment income (National Association of College and University and Business Officers, 2010). Additionally, more full-time entering freshman are also receiving these

awards, with the percentage increasing from 78.8 percent in 2000 to 82.3 percent in 2008 (National Association of College and University and Business Officers, 2010).

The growing reliance on tuition discounting seems to be part of a broader trend toward awarding merit based aid through discounted dollars, which may have a much more troubling side effect; limiting access to higher education. The NACUBO study found that, among private non-profit institutions, only 36 percent of the of grants awarded as institutional grant aid was based exclusively on financial need; 41.5 percent of these awards were based on non-merit criteria, while 22.5 percent was based on a combination of need-based and non-need criteria (National Association of College and University and Business Officers, 2010).

In theory, tuition discounting can be used to facilitate need-based scholarships, by charging wealthier students a higher tuition rate and shifting these resources to less well off students. While some of the merit based grants are awarded to students with need, the effect of the current practice of tuition discounting has been to siphon scarce institutional resources away from need-based aid, awarding much of it to students and families with a greater ability to pay for college education. Such practices, while potentially optimizing from an institutional perspective collectively imposes extra barriers to needy students. This practice is at cross purposes with public policy goals of enhancing access and college choice, and should be examined more closely. Assessing the extent to which college prices, as distinct from college costs, are affected by tuition discounting and burden shifting is also an important area for future research.

While a cost disease does seems to affect higher education costs, and the failure of public sources of support to keep pace with higher education costs have also led to

rapidly rising tuition sticker prices, the widespread use and increasing reliance on tuition discounting has also exacerbated the pace of tuition sticker prices. This also suggests that, in addition to a cost disease, higher education prices may also be affected by some of the factors identified by other scholars associated with non-profit institutions, including the quest for excellence and prestige, and the competition this engenders. A more holistic understanding of cost and price escalation among institutions of higher education may combine elements of both these explanations. This will be explored more fully below.

Discussion and Analysis

There seems to be a paradox related to higher education, which has serious implications for government policy: while the higher education sector is vital to conducting cutting edge research, creating a well-educated workforce and enhancing the productivity of the American economy, its internal production process seems to suffer from the "productivity immunity" first described by Bruce Johnstone (1993), which results in faster-than-inflation cost increases. These faster-than-inflation cost increases have been observed since 1961, when the higher education price index was first conceived, and have continued unabated though today.

The dilemma facing state and federal officials regarding higher education policy is exacerbated by another finding of this study: that a general cost disease exists among services relative to the manufacturing sector, in this study associated with durable goods. Since most of the functions of state and federal government are associated with the provision of services, this also means that costs associated with public sector will be increasing faster than those associated with the general economy. This means that even in

relatively prosperous times, the states and the federal government face tough allocation decisions in budgeting scarce resources among competing social claims.

However, this has become especially acute during the latest recession beginning in 2008. In fiscal year 2010, the states faced budget gaps totaling $196 billion, in response, 43 states have cut their state workforce, 30 states face cuts in their early childhood and K-12 education program, 29 states face cuts in their public health budgets, and 39 have planned cuts to support for their higher education sector ("States in the Red,"). Meanwhile, during 2009, revenue to the federal government declined by 17 percent ($420 billion), while spending increased by 18 percent ($536 billion), creating a budget deficit of $1.4 trillion. The resulting budget deficit equaled 9.9 percent of the Gross Domestic Product, the largest deficit relative to the GDP since World War II. While decreasing slightly, the Congressional Budget Office estimates that the U.S. Federal deficit will be $1.3 trillion for FY 2010 (Congressional Budget Office, 2010).

A general cost disease raises severe challenges not only for higher education finance in particular, but more generally for the financing of government programs and those goods which are seen as socially beneficial: since the bulk of government programs are service-based, a general cost disease associated with services suggests that the cost of government will continue to rise faster than general inflation. Significantly, along with higher education, health care and K-12 education have been identified as services also facing a cost disease, compounding the relentless pressure on government budgets (Baumol, 1967, 1993; Gundlach et al., 2001; Snower, 1993).

Nor is the United States alone in facing these challenges in funding public services; the lingering effects of the 2008 recession has placed severe stains on the

budgets of many European Union member states (Erslanger, 2010), particularly support for higher education (Labi, 2010). The escalating costs associated with the provision of services have also been linked to a general cost disease facing other OECD countries as well (Gundlach et al., 2001; Snower, 1993).

While the services are not devoid of any productivity grains, these will be lower than those associated with the manufacturing sector. The Bureau of Labor Statistics estimated that productivity in the manufacturing sector increased at an annual average rate of 4.0 percent between 1990-2000, and by an annual average rate of 3.7 percent between 2000-2007; in contrast, productivity increases in the non-farm business sector which includes a wide number of businesses, increased at an average annual rate by 2.1 percent between 1990-2000, and 2.6 percent between 2000 and 2007 (Bureau of Labor Statistics, Labor Productivity and Costs).

As long as the general economy experiences productivity increases, society should be able to support its government programs. However, this will involve potentially vexing and socially contentious issues in determining the relative portions of the economy which should be allocated between the private and public sector, and may require increased taxation to support the level of government services which are deemed socially beneficial. This includes support for higher education.

In this environment of severely constrained resources, the higher education community cannot simply expect revenue enhancements based on prior good will or past services rendered. Public support for higher education, both through direct subsidies to public institutions, and indirect support provided as need and merit-based aid to students must be centered on the benefits which higher education provides to the rest of society.

Public Funding: Finding the Balance between Private Benefits and Public Positive Externalities:

The general argument for providing public support for higher education is based on the classic case of public externalities: The education of a highly skilled work force provides benefits to society beyond the personal benefits received by the individual student, although these are considerable, typically including increased earning potential, a reduced likelihood of unemployment, and, if unemployment occurs, less time spent among the unemployed.

The greater the extent to which society benefits through the creation of highly skilled workers who enhance the competitiveness and productivity of the workforce, the stronger is the argument for public support. In this case, a higher education sector left strictly to market forces would produce a socially inefficient amount of students receiving advanced degrees, since this market would be based strictly on the private benefits received by particular students. Public investments in higher education are needed to ensure that a socially optimal amount of higher education is produced, based on the residual benefits received by society independent of private benefits received by students.

Blundell, Dearden, Goodman, and Reed (2000) have further categorized these benefits into three distinct groups: (a) private financial returns, defined as the extent to which an advanced degree improves earning potential or jobs prospects, (b) private non-financial returns, which encompasses the benefits an individual receives not measured by earnings, such as more desirable and interesting work, and (c) Social returns, which

defines the benefits that higher education provides to other members of society beyond the private returns received by degree recipients.

The social returns to education are substantial, including enhanced productivity, a highly skilled workforce, a larger tax base, and broader civic responsibility (Carnegie Commission on Higher Education, 1973; Caroll & Emre, 2009). Moreover, recent projections on the future needs of the U.S. workforce indicate that advanced education will be even more critical to U.S. economic prosperity. A recent research study conducted by the Georgetown University's Center on Education and the Workforce indicated that 63 percent of all jobs in the US economy will require at least some college-level education by 2018, up from just 28 percent in 1973 (Carnevale, Smith, & Strohl, 2010). Based on the structural changes transforming the economy, Carnevale, Smith and Strohl (2010) estimate the U.S. will need an additional 22 million workers with a college degree; however, based on current college attainment rates, they project a gap of 3 million degree recipients required by the economy. This will pose serious challenges to American prosperity and the ability to compete in a rapidly globalized knowledge economy.

The social benefits derived from higher education have important policy implications on the appropriate level of public investment which should be allocated to higher education, as well as on the appropriate mechanism through which student education should be funded. These issues will be explored along with other policy recommendations in the next section.

Policy Recommendations

Funding for Higher Education Need-Based Aid Programs

The evidence found in this study reveal a number of issues which hopefully can help guide public policy associated with higher education. First, the rate of increases associated with higher education costs is not statistically different from the rate of price increases associated with Services included in the National Income and Product Accounts. Furthermore, the aggregate rate of increases associated with all NIPA Services was significantly statistically higher than the rate of increases associated with NIPA Durable Goods. Significantly, most of the services tracked as part of the NIPA Index were supplied by profit-oriented industries; this suggests that the all services, irrespective of the ownership structure of the firm are affected by a cost disease, higher education among them. The results described in Chapter IV provide strong evidence that the rate of cost increases associated with higher education have not been excessive, nor based on the factors idiosyncratic to non-profit institutions of higher education.

This strongly supports the argument that both states and the federal government should attempt to increase public investment in higher education, especially support associated with need-based aid programs, at the rates which approximate increases in the higher education price index, on a per-capita student basis. The extent of government support for higher education will be based on the social benefits derived from higher education. As indicated above, these are substantial, and are spread across the degree earner's lifetime and involve significant benefits to all taxpayers. Social benefits derived

from enhanced degree attainment include larger tax payments based on higher wage earnings, less need for social support programs and consequent government transfer payments, as well as reduced likelihood that an individual will engage in criminal activity (Caroll & Emre, 2009).

The Obama administration has highlighted the importance of advanced education in achieving broad national objectives, and has recommended a considerable enhancement in the Federal government's investment in its support programs for needy students: the President's 2011 Federal Budget calls for a 29.2% increase in the Pell Grant program, which provides a national floor for need-based aid ("Highlights of Obama's Fiscal 2011 Budget for Higher Education and Science," 2010). Moreover, the President has proposed making the Pell Grant an entitlement, which would be allocated an automatic increase each year based on the number of students who qualify. Finally, in a signal which may reflect an intrinsic understanding of the cost disease facing higher education, the President has proposed increasing the maximum Pell Grant each year by one percentage point above the rate of inflation (Basken, 2010).

However, both the States and the Federal government face an extremely crowded legislative agenda, with many competing claims among extremely beneficial social assistance programs. Institutions of higher education must earn the public's trust and as well as their financial support by working to minimize institutional policies which act at cross purposes with state and federal policy objectives. This includes the heavy reliance on tuition discounting.

Institutional Tuition Discounting and Public Policy

As described above, the use of tuition discounting is both widespread and increasing. In 2009, the average aggregate discount for the entering freshman class of full-time students was over 40 percent (National Association of College and University and Business Officers, 2010). While mostly observed at private institutions, the use of tuition discounting has been increasing among public institutions as well (Baum & Lapovsky, 2006).

Some may question why this practice would impact public policy, since institutions are leveraging their tuition revenue to help shape the academic character of their entering college classes. However, a strong guiding principle of state and federal higher education policy is to maximize the scarce dollars invested in higher education to increase access to college, particularly for disadvantaged students, along with maximizing student choice in deciding on attendance.

There is a legitimate concern that tuition discounting, which in practice often awards large merit scholarships to students with desired academic credentials, and who are often from more well-off families, dissipates the effectiveness of federal and state need-based awards. Needier students receiving state or federal aid may in fact face a higher institution-discounted tuition price (before federal and state aid are accounted for) than less needy students. Seen in this way, state and federal need-based aid awards have the unintended consequence of subsidizing the institutional merit-based policies, reducing the effectiveness of state and federal efforts. This practice has been criticized as one which in effect helps reduce the enrollment of low-income students in colleges and universities (Kean, 2006). While it is outside the scope of this study to examine the extent

to which federal and state need-based aid awards are "captured" by institutions, the practice erodes public confidence in the institutional commitment to broader social purposes. The Obama administration has recognized the importance of increased enrollment in achieving national objectives, the President (as cited in Nelson, 2010) offered a challenge to institutions of higher education during his 2010 State of the Union address, stating: "In the United States of America, no one should go broke because they chose to go to college. And by the way, its time for colleges and universities to get serious about cutting their own costs – because they have a responsibility to help solve this problem" (Nelson, 2010). While the public commitment to higher education has been generous, this should not be viewed as a bottomless pool of resources; public patience is wearing thin, and practices such as tuition discounting erode public support.

Increasing Productivity

The presence of a cost disease implies that the rate of cost increases associated with services will be higher than those associated with the manufacturing sector. However, this does not mean that productivity increases are impossible, nor is the rate of productivity gains constant over time, even in the service sector. New technology or different approaches to output can lead to increases in productivity. Increasing productivity in higher education is an important concern worth exploring. However, this must mean more than merely placing more students in class sections, or even changing the allocation mix of faculty time among teaching education and research, as is often suggested.

While increasing the ratio of students to faculty would provide immediate "productivity gains", this would surely lead to a decrease in quality over time, reflecting

the classic dilemma associated with a service sector where labor itself is the end product of output. However, assessing the appropriate balance between the ratio of faculty to class sizes for various academic programs of study and courses within programs may provide a baseline to help colleges and universities manage the allocation of staff. This can provide some useful insight as a basis for discussion on institutional staffing, but is not an end in itself to staffing strategy.

Nor is the reallocation of faculty time among the components of teaching, research, and service in itself a valid method of increasing faculty "productivity". As Johnstone (1993) has argued, increasing the amount of time faculty at research universities engage in teaching at the expense of research will not make them more productive, but merely reassign them to a different job involving relatively less research. Moreover, to the extent that the research conducted at colleges and universities enhances national prosperity and economic competitiveness, such a reallocation would likely harm overall economic output over the longer term.

However, assessing the optimal balance of teaching, education, and research may involve different time allocations for particular faculty members over time. Academic departments should actively assess the research and service productivity of its faculty, which may lead to relative shifts in the time allocations toward greater teaching as faculty research output changes. While this would lead to increased efficiency of the use of faculty time, this is unlikely to increase overall faculty productivity, merely a reallocation of time to different productive outputs (Johnstone, 1993).

Increasing Productivity: Technology and On-Line Classes, Possibilities and Limitations

Many people have recognized the link between increasing productivity and reduced costs, and have suggested ways to increase productivity in producing higher education as a way to stave off cost increases (Vedder, 2007). This has proved to be somewhat elusive, although many have focused on the possibility of leveraging new technology as a way to reduce the intrinsic costs associated with providing higher education services.

However, it seems there are two distinct sources of cost savings associated with the use of on-line education, which have become muddled together, and a possible source of confusion. Much of the use of this technology as a method of reducing the cost of delivering education to students is not associated with the delivery system, but with mix of personnel contracted to lead online classes, and the sectors of the educational community which have most embraced the new technology.

During the last several decades, a major shift has occurred in the employment practices at colleges and universities, partly in response to rapidly accelerating costs; the increase in the number of contingent and part-time faculty relative to number of full-time and tenure-track positions (Schuster & Finkelstein, 2006). In 1970, 474,000 instructional faculty were employed in degree granting institutions, including 369,000 full-time and 104,000 part-time instructional staff, reflecting a full-time percentage of 77.9 percent. By 2007, a total of 1,371,000 faculty were employed by degree-granting institutions, however, only 703,000 (51.3 percent) were employed full-time, while 688,000 were employed on a part-time basis (DES, 2009, Table 249). While statistics on the type of faculty teaching online classes are difficult to find, it seems that many of the faculty associated with teaching online classes are part-time; this is particularly true of the sector

of higher education which has most embraced the new technology, for-profit colleges and universities (Morey, 2004). This is certainly true of the largest for-profit university, the University of Phoenix. The University of Phoenix does not employ any tenured faculty. In 2004, it employed only 285 full-time faculty, and 17,000 part-time faculty. Four thousand of the part-time faculty were employed in its University of Phoenix online program (Morey, 2004).

Moreover, even among full-time faculty, there is a large difference in pay between non-profit private and public institutions and profit-oriented higher education institutions. During the 2008-09 academic year, the average faculty salary of U.S. full-time faculty was $73,570; this included an average salary for employees at public non-profit institutions of $71,237, $79,358 for those employed at private non-profit colleges and universities, and $52,557 for full-time employees at for-profit institutions (DES, 2009, Table 259).

Thus, when assessing the potential of technology to increase productivity and reduce costs in delivering education to students, it is important to first isolate the potential savings to institutions of higher education based on using part-time and contingent faculty as opposed to cost savings exclusively associated with the enhanced capabilities of online technology.

A similar problem related to productivity gains in the use of computer based education involves class sizes of online classes. The researcher was unable to locate statistics identifying the size of online classes, however, while content delivery technology may facilitate increasing enrollment in online classes, these "productivity gains" would be similar to enrolling more students in traditional classrooms as a way to

decrease unit costs. Future research assessing the relative class-size of on-line and in-person course sections would provide more up-to-date estimates of how this new technology is being used, and provide aid in the assessment of academic quality of online versus face-to-face teaching.

However, the potential for genuine cost savings using computer based content delivery are real, although probably smaller than suggested, once class size and the employment status of professors leading on-line classes are accounted for. The most immediate savings involves infrastructure costs: using computer technology, course delivery can be separated from the extremely expensive infrastructure and maintenance costs associated with traditional brick-and-mortar college and university classroom space. While the delivery of online courses involves initial added investments in the technological infrastructure necessary to enable interactive exchanges among students and professors, these are relatively inexpensive compared to huge investment in facilities required to teach face-to-face classes.

This has become a critical concern as state budgets have failed to keep pace with per-capita increases in FTE student enrollments, and more recently, deficits have forced cutbacks to higher education across a large number of states, as described above (Hebel, 2010). The infrastructure costs to support traditional higher education are substantial; in current dollars, combined capital appropriations and capital grants and gifts associated with public degree granting institutions increased from $ 7.96 billion during the 2002-04 academic year to $ 10.84 billion during AY 2006-07 (DES, 2009, Table 352.) While online courses will not eliminate the need for investment in facilities and other infrastructure, it may reduce the rate of cost increases since, even for traditional brick-

and-mortar institutions, not all students would be required to be seated in campus facilities to the same extent.

Increasing Efficiency

The cost of completing undergraduate associate and bachelor degrees are high, both from the standpoint of student and families and the resource investment by society. Increasing the efficiency associated with degree attainment provides one of the most important ways to increase the overall productivity and reduce costs associated with colleges and universities. Johnstone has described this as increasing the "learning productivity" of American higher education (Johnstone, 1993).

Four year degree completion rates have somewhat increased for first-time full-time undergraduates attending 4-year colleges, from 33.7 percent for the entering 1996 cohort, to 36.2 percent for the Fall 2001 cohort. The 6 year graduation rate has also slightly increased, from 55.7 percent for the fall 1996 cohort to the 57.3 percent for the fall 2001 cohort (see Table 10).

Table 10.

Percent of All First-time Full-time Entering Students at 4-Year Institutions Completing Undergraduate Degrees: Fall 1996 Through Fall 2001 Cohorts

Entering Cohort	Within 4 Years	Within 5 Years	Within 6 Years
1996 Cohort	33.7	50.2	55.4
1997 Cohort	34.1	51.1	56.0
1998 Cohort	34.5	51.5	56.4
1999 Cohort	35.3	52.3	57.1
2000 Cohort	36.1	52.6	57.5
2001 Cohort	36.2	52.6	57.3

Source: Digest of Educational Statistics 2009, Table 331

Meanwhile, degree completion rates for students attending 2 year colleges have slightly declined; the 150 percent certificate or associate degree completion rate for full-time, degree seeking students for all institutions decreased from 29.3 percent for the 1999 Starting Cohort to 27.8 percent for the 2004 starting cohort (see Table 11).

Table 11.

150 Percent Certificate or Associate Degree Completion Rate for Full-time Degree Seeking Students: 1994 Through 2004 Starting Cohorts

Entering Cohort	All 2 Year Inst	Public Institutions	Private Non-Profit
1999 Starting Cohort	29.3	22.9	44.7
2000 Starting Cohort	30.5	23.6	50.1
2001 Starting Cohort	30.0	22.9	54.8
2002 Starting Cohort	29.3	21.9	49.1
2003 Starting Cohort	29.1	21.5	49.0
2004 Starting Cohort	27.8	20.3	44.4

While increasing, the 6-year degree completion rates for first-time full-time students are still less than 60 percent, an attrition rate which represents considerable expense for those not completing a degree, and a huge investment of public and private resources. Rapidly rising costs may also compound the need for lengthened study, since some students may be required to reduce academic their course load or even temporarily drop out to earn money to finance their college education (Johnstone, 1993).

Online educational technology may provide critical assistance in shortening degree attainment for students. The technology, combined with a large number of institutions delivering course content, can increase student access to courses, allowing them to complete required courses with greater ease and convenience (Allen & Seaman, 2007).

Increase High School Proficiency

It is much more expensive to teach students in postsecondary institutions than in high school. However, an increasingly large number of college students are required to take remedial coursework, particularly in math and English, due to deficiencies in high school preparation, with additional costs. As Terry Hartle, the Senior Vice President for Government and Public Affairs at the American Council on Education explained, "If you're academically prepared for college, you're far more likely to graduate. Remedial education is expensive and inefficient, and if we're able to reduce it, we'll be able to focus on college-level work" (Sewall, 2010).

This is a complex issue involving the educational pipeline from high school to college, perhaps even earlier. Since access to higher education is a primary mechanism of equality or opportunity, colleges and universities must no doubt continue to afford the opportunity of remediating deficiencies among entering students. However, this issue must be assessed holistically in order to increase the effectiveness of resources allocated at all levels of the educational pipeline. In an era of constrained resources, all levels of education must do a better job at education to ensure students have the appropriate level of knowledge as they advance between different levels of the education system. Having students achieve the appropriate level of pre-collegiate education before entering college would provide significant system-wide cost savings, and may even enhance high school graduation rates as well.

The newly released "Common Core State Standards," developed by the National Governor's Association Center for Best Practices and the Council of Chief State School Offices in June, 2010, may provide an important framework to achieve these objectives.

One of the stated goals of the new standards are to incorporate college and career standards into the K-12 curriculum (Common Core State Standards Initiative, 2010). In addition to enhancing the education of students in the K-12 system, the new standards may provide an important mechanism in creating a rational educational transfer throughout an extended K-20 educational pipeline, increasing total system-wide efficiency and reducing the costs of remediation within college.

College Credits in High School

Students are able to earn advanced placement credit in high school which may be able to be applied in college; however, the opportunity to earn these credits is often limited to the most advanced high school students. Proposals for expanding the opportunity for a greater proportion of high school students to earn college credit are not new (Johnstone, 1993). However, this has taken on greater significance with rapidly rising college costs, and new international models on how these partnerships can work. The ability for high school students to earn college credit in high school would create greater efficiency in the utilization of resources in colleges and universities. As Johnstone indicated in 1993, increasing learning productivity requires greater collaboration between high school and institutions of higher education. With rapidly rising college costs, fostering additional opportunities for high school students to earn college credits take on added significance. By improving the articulation of coursework between high school and college, the proposals associated with the K-12 Common Core Standards Initiative may not only improve college-level readiness in high schools, but may also be used to allow a greater proportion of high school students to earn college credits.

Three Year Undergraduate Degree

The idea of earning an undergraduate degree in 3 years is not new; Judson College, located in Alabama has offered a 3-year degree for over four decades (Alexander, 2009), and Johnstone (1993) suggested redesigning the academic calendar to facilitate year-round learning. However, the rapidly increasing costs associated with higher education and the failure of government support to not only keep pace with increases in the Higher Education Price Index, but also recent cutbacks in state support have added to the impetus to increase institutional productivity by utilizing facilities more effectively, and reducing the time required to compete an undergraduate degree.

In a New York Times editorial (Trachtenberg & Kauvar, 2010), Stephen Joel Trachtenberg, the President emeritus of George Washington University, supported the idea, suggesting that all colleges should strongly consider creation of a 3-year degree program, based on the per-student cost reduction, and the possibility to maximize the use of institutional infrastructure:

> Three-year curriculums, which might involve two-full summer of studies with short breaks between terms, would increase the number of students who could be accommodated during a four-year period, and reduce institutional costs per student. While there would be costs for the additional teachers and staff, those would be offset by an increase in tuition. Meanwhile, institutions that go quiet in the summer, incurring the unnecessary expense of running nearly empty buildings, would be able to use their facilities year-round. (Trachtenberg & Kauvar, 2010)

In addition to the increased degree efficiency and productivity associated with a 3 year degree, there may be additional benefits: the ability to more effectively compete with higher education institutions in the European Union and those included in the European Higher Education Area, which have standardized a common European degree across counties member states, which also utilize a 3 year degree (Adelman, 2008, 2009).

This process, which began in 1999, now includes the institutions of higher education across 46 nations, also including the United Kingdom, Russia, and Turkey. Meanwhile, Australia, New Zealand, China, and India have also been closely monitoring the EHEA framework, and 18 nations in Latin America are developing the "Tuning Model," the portion of the Bologna process which attempts to align goals among academic disciplines (Labi, 2009). A unified degree structure based on a standardized three-year undergraduate degree, but which also links degree knowledge and attainment to employment, will pose an increasingly appealing competitor to the traditional model of higher education historically offered in the United States. A 3-year degree many not only enhance productivity and learning efficiency, but also help U.S. institutions of higher education more effectively compete in a rapidly globalizing educational marketplace.

Financing of Higher Education

The principle finding of this study, that higher education costs are affected by a systematic cost disease, has important implications for the financing of higher education for both states and the federal government. Much of the current policy debate associated with financing higher education has been focused on the reason for rapidly rising costs and tuition sticker prices. As indicated in Chapter IV, cost increases associated with higher education are not statistically different from price increases associated with Services tracked in the National Income and Product Accounts. Most of the NIPA Services are associated with profit-oriented industries, which suggest that much of the increasing higher education costs are not as easily controlled as many critics contend. This provides a strong argument that federal and state support for higher education should increase at the same rate as the Higher Education Price Index, on a per-capita full-

time equivalent student basis, to the extent possible. Obviously, both the states and the federal government face many competing social claims on the allocation of public resources, which have to be weighed carefully in distributing public funds. This also means that public resources which are allocated to higher education should be targeted to maximize their utility and effectiveness. This leads to additional considerations, which are explored below.

Allocation of Higher Education Public Funding: Institutional Subsidies, and State Need and Merit-based Student Assistance Grants

Since public resources are scarce, all federal and state funds should be allocated to achieve maximum effectiveness. This raises the question of how effectively public funding is currently being utilized to achieve state and national policy objectives.

State Need versus Merit Grants

Almost parallel to the growing use of tuition discounting in the awarding of institutional merit based grants, there has been an increasing tendency on the part of the states to offer merit-based as opposed to need-based grants. The percentage of full-time dependent students receiving state grants increased from 14 percent during AY 1992-93 to 28 percent during the 2008-09 academic year (Baum, Payea, & Steele, 2009). The average grant per recipient increased from $2,350 in AY 1992-93 to $3,130 during AY 2007-08 in constant 2007 dollars. However, the proportion of aid distributed using need-based criteria has declined significantly, from 90 percent in 1992-93 to 72 percent in 2007-08. Meanwhile, during the 200-08 academic year, 47 percent of students coming from families with parental income less than $ 32,500 received an average grant of

$3,400, while 13 percent of students coming from families with parental income of $100,000 or more received an average state grant of $3,000 (Baum et al., 2009).

The primary principle in awarding government assistance grants to college students is to broaden access to a college education to create equality of opportunity (Carnegie Commission on Higher Education, 1973). While there is no doubt justification for the awarding merit-based state grants, enhancing access to education is best achieved through need-based grants to the neediest students.

This is particularly important in the context of rapidly rising costs, where state support has failed to increase at the rate associated with the higher education price index on a per-capita student basis. While many of the state merit-based grants are no doubt awarded to students who have some need, these outcomes are incidental to the method of awarding merit-based grants. Much of this non-need grant aid, particularly to students from families in the highest income brackets, is awarded to students who would have attended college regardless of this financial support. In an era of constrained public resources devoted to higher education, this dissipates the effectiveness of state financial assistance. The most effective use of direct student assistance grants is in the form of need-based aid, with the purpose of increasing college participation among students from family income brackets with historically lower college attendance. By reducing the opportunity cost of attending college for needy students, these targeted need-based grants would be more effective in inducing students who might otherwise not attend college to enroll, increasing the aggregate social benefits of college attendance.

Institutional Subsidies vs. Student Need-based Grants

As indicated above, the primary justification for a public investment in higher education stems largely from the social benefits achieved through broader participation in undergraduate education. Currently, there are two primary mechanisms for public support for higher education: direct institutional subsidies as well as grants (both need and merit-based) and loans to students.

The vast majority of state assistance involves direct subsidies to public institutions. This translates into significantly cheaper tuition charges at public institutions. In 2008-09, the average tuition and fees for all public institutions was $12,113, while the average tuition and fees for non-profit institutions was $31,921 (DES, Table 334).

Special support for public institutions is desirable to the extent that public institutions serve particular state interests associated with community service and extension activities, continuing education, and research (Carnegie Commission on Higher Education, 1973).

However, many of the social benefits achieved through college attainment accrue to society irrespective of whether a student attends a public or private institution (Carnegie Commission on Higher Education, 1973). Moreover, the general subsidy provided to students attending a public institution accrues both to students from wealthy as well as needy families. An argument could be made that this dissipates the effectiveness of direct institutional subsidies in increasing attainment rates, since some of the funding allocated to public institutions accrues to students with relatively greater ability to pay.

Given rapidly rising costs affected by a cost disease, and constrained public resources allocated to the higher education sector, it seems a relative reallocation of state aid away from direct subsidies to institutions and toward increased need-based aid would better maximize the limited funds committed by the states to increase access and opportunity to those students experiencing relatively greater need.

Income Contingent Loans

With rapidly rising college costs and uneven state and federal grant support, the aggregate amount of student loan debt has been increasing substantially. To gain perspective, in constant 2008 dollars, the amount of money awarded through the Pell Grant program increased from nearly $9.74 billion in academic year 1998-99, to $18.2 billion in academic year 2008-08, an increase of 87 percent. State grants (both need and merit-based), increased from $4.95 billion during the 1998-99 academic year, to $8.492 billion during the 2008-09 year (in constant dollars), an increase of 72 percent (Baum et al., 2009).

During the same period, subsidized loans (loans for which the federal government pays the interest while a student maintains at least half-time residency in college) increased by only 45 percent (from $21.981 billion in AY 1998-99, to $31.95 billion in AY 2008-09. Meanwhile, unsubsidized loans (for which the student either pays the interest rate during college or it is capitalized into the loan's principle) increased by 165 percent (from $14.691 billion during AY 1998-99 to $38.9 billion in AY 2008-09 (Baum et al., 2009).

However, even this masks the great shift in loan-based support; during the same period, PLUS loans, federal loans offered to parents based on their credit-worthiness,

increased 194 percent, from $3.985 billion in AY 1998-99 to $11.732 in AY 2008-09, while non-federal alternative private loans, often charging high interest rates, increased from $3.91 billion in AY 1998-99 to 11.9 billion by AY 2008-09, an increase of 204 percent (Baum et al., 2009).

Two-thirds of students graduating with a college degree incurred some type of personal loan debt; student debt has been increasing approximately six percent per year since 2003-04, with an average student loan of $23,200 for the class of 2008 (Reed & Cheng, 2009). However, this debt picture is highly deceptive, since it accounts for only student-based loans, and fails to account for the total family debt which includes rapidly rising parent PLUS loans and non-federal alternative loans, the fasting growing portions of all college-related loans. Other than aggregate loan volumes described above, the researcher has been unable to uncover loan debt averages which account for all sources of loans.

This alarming rise in student debt may act as a deterrent for qualified students to attend college, particularly for students from low income families. With rapidly rising costs affected by a cost disease, and loans a growing component of student aid, it is vital to place the system of student loans on a more rational footing: this involves moving away from the current method of mortgage-style student loans toward more student-friendly income-contingent system of student loans.

There is strong theoretical support for some system of student loans; since the student is a primary beneficiary of the education s/he receives, students should pay for at least some part of their education. Loans are available for students and their families who lack the capability to finance a student's education from current resources. However, it is

extremely difficult to create capital markets surrounding the provision of human capital, since it is impossible to collateralize a person's education. Due to these risks, capital markets may not be willing to provide a sufficient level of financing for education at socially desirable levels (McPherson & Shapiro, 1991).

Moreover, there is a problem associated with risk: while in the aggregate, a college education is a very good investment, the returns fluctuate wildly based on a number of personal idiosyncratic factors, in addition to the type of degree a student earns. Additionally, students failing to complete a degree would still face steep loan repayments. In these circumstances, a student financing an education primarily through loans would be hobbled by substantial debt, which could prevent him/her from achieving other aspirations such as purchasing a home. Facing these risks, a number of college capable students may choose not to attend college, even though they could benefit substantially from a college education (Chapman, 1997; McPherson & Shapiro, 1991).

Income contingent loans may provide a mechanism which ensures students pay for some of the personal benefits which accrue to them from earning a college education, but which minimize these barriers to student participation. This concept is not new, the idea was first proposed by Milton Friedman in 1955 (Congressional Budget Office, 1994). While they can be implemented in a variety of ways, the basic component of income contingent loans is that repayment is based on income earned over a period of time, so the amount repaid is variable based on the income of the borrower. Depending on the plan, the amount borrowed is paid back over a specified time period, , usually from 12 to 20 years. So, unlike mortgage-type loans, which involve a fixed repayment schedule regardless of the borrower's income, the amount paid back depends on the

future earnings of a student. This greatly reduces the uncertainty and risk associated with borrowing, since payment is tied to one's ability to repay, not a unalterable payment schedule (Barr, 1993).

Australia is the country which has most embraced this repayment system. Facing both an improving high school retention rate, along with a demographic increase in the number of college bound students, Australia's higher education system went through a rapid expansion. The Australian government could no longer afford to maintain the free tuition system first created in 1974. However, the government did not want the new financing system to become a barrier which would discourage enrollment, especially for the economically disadvantaged (Chapman, 1997).

Beginning in 1989, Australia introduced the Higher Education Contribution Scheme (HECS). Under the new system, students have the option of paying the HECS fee when initially enrolling at an institution, at a discounted rate of 25 percent, or the HECS fee is deferred until after graduation. Payments are then automatically collected through the tax system as they begin earning income after graduation. However, students were charged the full cost of their education; under the initial framework, the student income contingent loan was equal to 20 to 25 percent of the actual subsidy provided to students (Chapman, 1997).

The system has a number of important benefits worth considering. First, it removes the tremendous burden associated with the repayment of student loans after graduation. Second, it provides default insurance for student borrowers, removing the uncertainty associated with borrowing for a college education.

The Obama Administration has taken the greatest step toward introducing income contingent loans for students, although still in very limited form. Beginning in the 2009-10 academic year, students were offered an income contingent loan repayment option for Federal Direct subsidized and unsubsidized loans, excluding PLUS (Parent) loans. Under the plan, repayment is based on adjusted gross income, family size, and total loan amount. There are two methods of calculating repayment: a repayment rate based on a 12 year schedule, multiplied by an income percentage factor which varies by income, or 20 percent of discretionary income. If payments have not covered the interest which has accrued on the loan, unpaid amounts are capitalized once a year. The maximum repayment period is 25 years, after which the loan is discharged (Department of Education, 2010).

While a start, the U.S. version leaves much to be desired; it is complex and confusing, involving the potential capitalization of interest, and still relatively high annual repayment amounts compared to the Australian plan. Perhaps worst of all, it only covers direct loans, the portion of student and parent loan debt which has been rising relatively slowly. It does not include Parent or alternative loans as an option for income contingent loans.

While the Obama administration has standardized portions of the loan system, eliminating private lenders associated with its subsidized and unsubsidized loan system, the U.S. student loan system has become a serious obstacle to expanding access to higher education. As described above, the terms of repayment are still complex and confusing, intimidating even to parents with prior experience. Students and parents are facing larger loan debts, with PLUS and alternative loans increasing at an alarming rate. Limiting

student risk with a rationalized system of income contingent loans will be an important method of increasing access to higher education, vital if the US is to compete in an increasingly globalized knowledge economy.

Administrative Salaries and the Costs of Regulation

An examination of the components of the higher education price index revealed that, while both faculty and administrative salaries increased faster than the aggregate HEPI index, the costs associated with administrative salaries rose even faster than faculty salaries. Adding even greater cost pressures on institutions, the number of administrative positions increased far faster than faculty positions. The proportion of managerial and executive positions increased from 5 percent in 1976 to 6 percent in 2007, while the proportion of non-teaching professional staff increased from 10 percent in 1976 to 20 percent in 2007 (DES, 2009, Table 244).

It is outside the scope of this study to determine the causes for the rapid rise in administrative positions. Many of the positions, no doubt, reflect the added technological complexity surrounding the delivery of education, such as technology managers and educational specialists. However, it seems many of the positions may be associated with greater accountability and oversight increasingly required by both the federal and state governments, as well as accrediting agencies. One former university president estimated that regulatory requirements cost his university 7 percent of all tuition revenue (Alexander, 2009). This suggests there may be a tension associated with the current regulatory climate, increasingly focused on assessment of outcomes and accountability of resources; the added scrutiny to account for the public resources invested in colleges and

universities, and the additional requirements associated with process and outcomes assessments, may actually be a cause for additional expenditures.

The rapid growth in administrative and professional non-teaching positions and the potential association to additional administrative oversight requires additional research; this also suggests that government regulatory bodies and accrediting agencies must strike a careful balance between needed regulations to ensure scare public investments in higher education are protected, without creating overly burdensome and excessive requirements on institutions, increasing costs even further.

Limitations of the Study and Areas for Future Research

This study focused on the extent to which a cost disease affects higher education; however, the analysis was limited by the datasets which were available. The higher education price index was first developed in 1961, as a way to assess cost increases specifically affecting higher education. The index was created is a composite, aggregating both public and private non-profit institutions. However, public and private non-profit institutions may face different cost structures. Beginning in 2001, the CommonFund Institute developed separate indices for public and private institutions. Although the dataset is limited, future researchers could attempt to analyze the cost and price behavior associated with each sector independently. This could enhance our collective understanding of the cost pressures faced by the different sectors within higher education.

As described in this chapter, the appropriate level of public support for higher education hinges on an accurate assessment of the private versus social benefits associated college attainment. This is a complex area of analysis, which involves some

subjective judgments. There have been a number of excellent studies conducted analyzing the effects of higher education, both in the United States and abroad. However, more research in this area may help to create a broader consensus on the impact of higher education, and by extension, the appropriate level of public investment required to meet federal and state policy objectives.

The discussion surrounding the relative distribution of private and social benefits of higher education impacts the financing of higher education. Fruitful areas of research include the appropriate funding mix between direct institutional subsidies for public institutions and general need-based grants awarded to students attending both private and public institutions, and the impact on access and equity through new mechanisms of college financing such as income contingent loans. To be useful, this should include a comparative analysis across various countries using different financing techniques. There is much to learn from the experience of other educational systems.

One of the conclusions of this study focuses on increasing the productivity associated with colleges and universities. This includes increasing the effectiveness of high school education to reduce the necessity of providing remedial coursework in college, using technology to increase the opportunity for students to take courses, and even serious exploration of a three-year degree program. More research needs to be conducted in these areas to assist high schools, colleges and universities to more effectively manage the academic enterprise, as they face rapidly rising costs with relatively diminished resources.

One of the findings of this study suggests that the service sector is affected by a cost disease, since the majority of government programs are service related, this has

broad implications for the area of public finance. While the service jobs are not devoid of productivity gains, a general cost disease suggests that costs associated with government programs will increase at rates faster than the general consumer price index. Moreover, the United States is not the only country impacted; it seems this issue affects most OECD countries as well.

Some of the costliest government supported programs including K-12 and higher education as well as health care seem to be affected. Providing the appropriate level of services may involve very contentious social issues, including the possible necessity of increasing taxes, as well as limiting or delaying benefit programs previously thought of as entitlements.

There has been some excellent research conducted on the impact of a cost disease on the provision of government services. However, most of these are several decades old. New research is needed to help guide public policy as we face very challenging resource allocation decisions, not only among various government programs, but also associated with the relative allocation of the economy between the public and private sectors.

Finally, the research revealed differing findings associated with the trajectory of higher education costs as opposed to tuition sticker prices. While higher education costs were found to be statistically non-significant compared with price increases associated with NIPA Services, higher education tuition sticker prices were found to be statistically significantly higher than price increases associated with the Service sector.

The analysis section revealed two of the most important causes, burden shifting and tuition discounting. The analysis indicated that the practice of tuition discounting is widespread and growing, involving both public and private non-profit institutions.

Moreover, the practice involves the widespread use of discounting to support merit scholarships, unrelated to need.

While college costs are indeed rising faster than the CPI, reflecting a cost disease, the widespread use of tuition discounting as a method to finance merit scholarships suggests that non-profit colleges and universities face incentives related to the behavioral motivations suggested in the literature review, including the quest for excellence, fueled by competition for prestige.

This suggests that a more holistic model of cost and price behavior should be developed, encompassing both the behavioral criteria suggested by such researchers such as Bowen (1980), Winston (1996,2003), and (Goethals et al., 1999), which also integrates revenue and cost components as well.

The researcher has attempted to create a more inclusive model below. Future researchers may attempt to continue research along these lines, seeking to determine the relative importance each of the variables in influencing cost and price behavior of non-profit colleges and universities. This may increase our collective understanding of the complex processes impacting not only cost and price issues, but also the micro-economic variables impacting the decision-making behavior of colleges and universities. The model is provided in Appendix H.

Conclusion

College costs have been rising faster than the inflation rate for nearly every year since the Higher Education Price Index was created in 1961. A large body of research has attempted determine the causes for rapidly rising college costs and prices, which can be divided into two broad categories. First are researchers who see the non-profit structure of most colleges and universities creating motivations involving the pursuit of excellence and prestige leading to behavior which encourages high expenditures. Bowen (1980) best articulated this point of view with his revenue theory of costs, in which he hypothesized that colleges would raise all the money they can, and spend all the money they raised.

Alternatively, a growing body of literature assigned rapidly rising institutional costs to a cost disease. This theory placed higher education cost increases within a broader phenomenon affecting the entire service sector, suggesting that due to limitations of leveraging technology, costs associated with the service sector tend to increase faster than those in the manufacturing sector.

This research attempted to analyze the extent to which a cost disease could explain higher education cost and price increases. This involved two distinct steps. First, the researcher analyzed the subcomponents of the Higher Education Price Index to determine the influence of personnel costs on higher education compared to other HEPI subcomponents. Secondly, higher education costs and prices increases were compared against three broad sectors: Durable Goods, Non-Durable Goods and Services, along with the aggregate price index.

Personal costs were found to be a major cost driver within the components of the higher education price index, and ANOVA Post-hoc analysis concluded that higher education costs were statistically non-significant compared to price increases associated with the aggregate Services index. This suggests that higher education costs are rising at the same relative rate as other service industries, irrespective of whether the ownership structure associated with particular service industries. This implies that cost increases associated with higher education are unrelated to the non-profit status of the majority of colleges and universities.

Moreover, price increases associated with non-durable goods were statistically non-significant compared to increases associated with durable goods (a proxy used for the manufacturing sector), while neither were statistically significantly different from aggregate price increases.

However, price increases associated with Services were found to be significantly higher than those associated with durable goods, suggesting that Service sector industries face a general cost disease. Additionally, price increases associated tuition sticker prices were found to be significantly higher than those associated with the Service sector.

Two main causes were assessed, including burden shifting and tuition discounting. It does appear that government support for higher education has failed to keep pace with increases in college costs on a per-capita student basis. However, it also seems that the practice of tuition discounting is both widespread and growing; this suggests that behavioral motivations such as the pursuit of excellence and competition for prestige impact non-profit institutions of higher education. The researcher proposed a new conceptual model for higher education cost and price behavior which encompasses

both behavioral as well as cost and revenue components to potentially explain higher education cost and price increases.

The presence of a cost disease poses serious public policy challenges; it suggests that the costs of government programs, which are primarily service-based, will increase faster than general inflation. For higher education, it means that there will be a variety of socially beneficial programs competing for public resources. Institutions of higher education hold a privileged position in society; however, public support must be based on the positive social benefits higher education provides to the broader society it serves. These benefits are considerable, including enhanced productivity and output, a more competitive workforce, a larger tax base, and broader civic responsibility.

However, the higher education community cannot take public support for granted; faced with a cost disease, institutions must increase the learning productivity of their processes, first articulated by Johnstone. This includes pursing objectives to increase persistence and graduation, and finding ways to complete a degree in less time than currently required.

A cost disease has serious implications for the way we finance higher education; rapidly rising costs have created a growing debt burden, especially as government support has failed to keep pace with higher education costs on a per-capita student basis. We should explore new methods of financing which minimizes the risk of crushing student debt after graduation, particularly through income contingent loans.

Since the social benefits of education accrue irrespective of whether a student attends a private or public institution, we should reconsider the allocation of public

support between direct subsidies targeted to public institutions, and expanding need-based aid programs for all students.

Higher education is still one of the primary mechanisms for ensuring equality of opportunity; it is also vital to national prosperity and enhanced productivity in a rapidly globalizing economy focused on knowledge creation. A cost disease threatens to create a serious bottleneck in access to a college education, at a time when other countries are expanding the knowledge base of their economy through investment in higher education. Hopefully, the findings in this study can help reduce the contentious debate concerning the causes of higher education cost and price increases, and refocus efforts on ensuring continued access to higher education to increase national prosperity.

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*Appendix A: Definitions**

Cost: Amount institutions spend to provide education and related services to students. These are measured through expenditures.

Price: The amount students and their families are charged and what they pay for educational services. There are a number of different prices, including sticker price, price of attendance, and net price.

Sticker price: The tuition and fees charged by an institution. (also called the Published Price).

Total Price of Attendance: Tuition and fees (sticker price) that institutions charge students plus other expenses, including housing (room and board if a student is living on campus, or rent and other housing costs for students not living on campus). This is also called the Cost of Attendance.

Net Price: The amount students and their families pay after financial aid is subtracted from the total price of attendance.

Revenue: Current fund revenues which institutions receive from a variety of sources, including tuition and fees, earnings from endowment income, government appropriations, government and private grants, and contracts, private gifts, the sale of educational services (e.g. dormitories and bookstores) and auxiliary enterprises.

Expenditures: Institutional spending for a variety of operating budget categories, including direct instruction, research, public service, academic support, student services, institutional support, operation and maintenance of plant, and scholarships and fellowships.

General Subsidy: The difference between the average price charged to students and the average cost to the institution for providing an education to a student, on a per-capita basis. Since institutions receive revenue from a wide variety of sources, both tuition and non-tuition based, almost all students receive a subsidy whether or not they attend private or public institutions, and whether or not they receive financial assistance. The general subsidy does not include an additional subsidy which some students receive in the form of scholarships and need-based aid. In many ways, institutional decisions about tuition and fees are also decisions about setting the level of the general subsidy.

Average Tuition: Institutions charge different categories of students different levels of tuition and fees. For example, there may be different fees and direct charges assessed for additional lab expenses, health services and exercise facilities. Moreover, many students

receive tuition discounts in the form of institutional aid, which results in net tuition prices which are lower than published tuition charges, or the 'sticker price".

* Appendix A; (Cunningham et al., 2001, p. 5).

Appendix B: Higher Education Price Index, Personal Consumption and Contracted Supplies and Equipment

			Personal Compensation Compensation Weight 74.8							
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation
1961	30.3	25.6	28.7	28.1	9.5					25.4
1962	30.6	26.5	30.1	28.9	10.2					26.5
1963	31.0	27.6	31.7	29.6	11.1					27.8
1964	31.4	28.6	33.1	30.3	12.3					29.1
1965	31.8	29.8	34.9	31.0	13.0					30.5
1966	32.6	31.1	36.9	31.8	15.0					32.3
1967	33.5	32.9	39.9	33.0	16.8					34.3
1968	34.6	34.9	41.8	34.7	18.9					36.6
1969	36.3	37.1	44.6	36.6	21.8					39.2
1970	38.5	39.5	47.7	38.8	24.7					42.1
1971	40.5	42.1	50.1	41.8	28.0					44.8
1972	41.9	44.3	52.0	44.9	31.1					47.1
1973	43.6	46.7	54.3	47.6	34.7					49.8
1974	47.5	49.9	57.2	50.6	38.6					52.8
1975	52.8	54.3	60.3	54.6	42.9					56.3
1976	56.5	57.8	63.5	59.0	47.8					60.0
1977	59.8	61.5	66.4	63.1	52.8					63.5
1978	63.8	65.7	69.9	68.1	58.4					67.6
1979	69.8	70.5	74.1	73.4	64.5					72.4
1980	79.1	77.5	79.4	80.2	72.6					78.4
1981	88.2	85.8	86.3	87.7	81.8					85.8
1982	95.8	93.9	93.7	94.6	91.5					93.5
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0
1984	103.7	104.8	104.7	105.1	108.3	104.7	104.5			105.4
1985	107.7	110.8	111.4	109.2	117.7	111.6	110.7			112.0
1986	110.8	116.3	118.2	112.8	127.7	118.4	117.7			118.8
1987	113.3	120.9	125.0	116.3	137.4	125.4	124.8			125.4
1988	118.0	126.2	130.9	120.6	147.2	131.6	129.9			131.7
1989	123.5	132.8	138.8	125.3	158.8	139.2	139.3			139.6
1990	129.4	140.8	147.6	130.3	171.4	147.7	150.6			148.3
1991	136.4	148.2	155.6	135.4	184.3	155.7	159.1			156.5

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

			Personal Compensation Compensation Weight 74.8							
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation
1992	140.8	153.5	160.8	140.2	194.3	161.1	163.6			162.4
1993	145.2	157.9	165.0	144.2	204.3	165.2	168.8			167.6
1994	148.8	163.3	170.3	148.2	213.6	170.1	175.6			173.3
1995	153.2	168.1	176.1	152.5	221.4	176.1	179.7			179.1
1996	157.4	173.0	181.7	157.3	224.5	181.2	188.3			184.1
1997	161.9	178.4	187.2	162.1	226.7	186.6	194.7			189.0
1998	164.8	184.7	193.5	168.0	236.7	192.9	200.9			195.8
1999	167.6	189.1	200.7	174.1	239.2	199.9	209.7			202.0
2000	172.5	196.9	208.4	180.4	254.6	207.3	219.6			210.8
2001	178.4	208.7	215.8	187.9	261.7	214.5	229.2	197.7	182.6	218.1
2002	181.6	212.7			277.1	222.7	236.4	205.4	189.6	
2003	185.5	223.5			292.3	229.4	255.7	211.1	193.9	
2004	189.6	231.7			312.8	234.2	263.3	217.1	197.6	
2005	195.3	240.8			327.2	240.7	274.0	223.4	201.4	
2006	202.7	253.1			343.7	248.2	287.7	229.5	205.5	
2007	208.0	260.3			260.8	257.6	299.2	237.7	213.6	
2008	215.7	273.2			380.7	268.1	314.0	245.1	220.5	

Source: Complied HEPI 2005 Update, pg. 3, HEPI 2004 Update, pp. 21-22

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2						Subindexes of Salaries of Professional Personnel Used for HEPI			
Year	Misc Services	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration/ Inst Services
1961	32.9	33.5	35.0	14.9	15.7	26.1				
1962	33.5	33.4	35.2	15.7	15.8	26.5				
1963	34.2	33.4	35.3	16.7	15.8	26.8				
1964	35.0	33.6	35.7	18.0	15.7	27.2				
1965	35.8	33.8	36.0	19.3	15.7	27.6				
1966	36.5	34.6	36.7	20.5	15.7	28.2				
1967	37.8	35.3	37.8	21.3	15.7	28.9				
1968	39.2	36.0	39.0	21.9	15.8	29.7				
1969	40.9	36.6	40.3	23.3	15.9	30.7				
1970	42.8	37.6	41.9	25.7	16.3	31.9				
1971	45.1	39.0	43.5	30.8	18.0	34.1				
1972	47.8	39.8	45.1	34.9	19.2	36.0				
1973	49.9	41.1	46.5	37.7	20.2	37.6				
1974	52.2	46.5	49.4	41.6	24.8	41.4				
1975	56.8	58.0	58.3	46.7	31.8	48.5				
1976	59.1	60.7	61.7	52.1	34.4	51.3				
1977	62.6	63.8	64.8	56.8	40.5	55.7				
1978	66.6	66.6	69.3	63.2	45.9	60.2				
1979	71.2	71.7	74.7	70.0	50.3	65.1				
1980	77.0	84.6	81.6	77.8	64.1	75.0				
1981	85.2	95.6	89.6	85.9	79.7	85.9	86.7	86.5	86,7	84.5
1982	94.2	100.4	96.4	93.5	92.4	94.9	93.9	92.0	93.9	93.1
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1984	104.9	99.7	102.3	105.3	102.5	103.0	104.7	104.2	104.7	104.5
1985	110.8	103.0	104.8	111.3	105.3	107.1	111.6	110.3	111.6	110.7
1986	115.1	102.6	107.2	121.2	103.1	109.0	118.4	116.4	118.4	117.7
1987	119.7	99.0	108.9	132.9	91.0	107.4	125.4	122.0	125.4	124.8
1988	123.0	101.1	120.5	140.5	87.7	109.8	131.6	127.7	131.6	129.9
1989	128.8	108.3	115.1	153.5	85.3	112.8	139.2	124.9	139.2	139.3
1990	134.0	114.3	119.6	167.0	90.1	118.7	147.7	142.2	147.7	150.6
1991	139.8	116.4	123.3	179.8	92.4	123.3	155.7	149.2	155.7	159.1

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2						Subindexes of Salaries of Professional Personnel Used for HEPI			
Year	Misc Services	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration/ Inst Services
1992	145.7	115.2	126.3	193.8	93.3	126.9	161.1	153.9	161.1	163.6
1993	149.5	113.2	128.6	203.4	94.7	129.4	165.2	157.6	165.2	168.8
1994	154.8	114.3	130.8	213.6	98.7	133.6	170.1	162.7	170.1	175.6
1995	158.0	115.7	133.5	220.2	96.8	135.3	176.1	171.0	176.1	179.7
1996	163.8	130.1	137.0	230.9	93.3	139.9	181.2	174.9	181.2	188.3
1997	167.3	128.6	139.3	253.4	106.1	147.2	186.6	180.8	186.6	194.7
1998	172.8	126.2	141.3	266.5	111.1	151.6	192.9	187.2	192.9	200.9
1999	177.0	123.2	143.3	282.1	100.5	150.8	199.9	193.7	199.9	209.7
2000	182.9	123.1	145.0	298.6	104.9	155.8	207.3	199.7	207.3	219.6
2001	199.8	131.8	147.3	317.4	169.9	172.2	214.5	207.7	214.5	229.2
2002	205.8	128.2			118.1		222.7			236.4
2003	209.5	132.2			157.6		229.9			255.7
2004	216.4	135.6			176.4		234.2			263.3
2005	222.7	145.5			200.2		240.7			274.0
2006	228.8	158.1			255.7		248.2			287.7
2007	238.3	165.3			220.6		257.6			299.2
2008	246.4	180.0			252.0		267.4			314.0

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

			Subindexes of Salaries of Professional Personnel Used for the HEPI			
Year	Library Personnel	Professional Salaries Total	HEPI Faculty	HEPI Admin	HEPI Benefit	Supply/Equip
1961						
1962						
1963						
1964						
1965						
1966						
1967						
1968						
1969						
1970						
1971						
1972						
1973						
1974						
1975						
1976						
1977						
1978						
1979						
1980						
1981	85.4					
1982	93.7	93.7				
1983	100.0	100.0	100.0	100.0	100.0	100.0
1984	104.9	104.7	104.7	104.5	108.3	103.0
1985	113.3	111.4	111.6	110.7	117.7	107.1
1986	117.1	118.2	118.4	117.7	127.7	109.0
1987	121.5	125.0	125.4	124.8	137.4	107.4
1988	124.6	130.9	131.6	129.9	147.2	109.8
1989	133.1	138.8	139.2	139.3	158.8	112.8
1990	139.8	147.6	147.7	150.6	171.4	118.7
1991	146.8	155.6	155.7	159.1	184.3	123.3

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

			Subindexes of Salaries of Professional Personnel Used for the HEPI			
Year	Library Personnel	Professional Salaries Total	HEPI Faculty	HEPI Admin	HEPI Benefit	Supply/Equip
1992	151.6	160.8	161.1	163.6	194.3	126.9
1993	155.5	165.0	165.2	168.8	204.3	129.4
1994	160.7	170.3	170.1	175.6	213.6	133.6
1995	167.1	176.1	176.1	179.7	221.4	135.3
1996	172.2	181.7	181.2	188.3	224.5	139.9
1997	176.6	187.2	186.6	194.7	226.7	147.2
1998	182.0	193.5	192.9	200.9	236.7	151.6
1999	188.8	200.7	199.9	209.7	239.2	150.8
2000	195.9	208.4	207.3	219.6	254.6	155.8
2001	198.6	215.8	214.5	229.2	261.7	172.2
2002			222.7	236.4	277.1	
2003			229.9	255.7	292.3	
2004			234.2	263.3	312.8	
2005			240.7	271.0	327.2	
2006					343.7	
2007					360.8	
2008					374.2	

Source: Higher Education Price Index, 2004 Update, pp 21-22, HEPI 2009 Update

Appendix C: Consumer Price Index, Higher Education Price Index, and Major Subcomponents, 1961-2001

Appendix C: Higher Education Price Index, Personal Consumption, and Contracted Supplies and Equipment, 1961-2008, Including Contracted Services, Supplies and Equipment, and Professional and Non-Professional Services from 2002-2008

			Personal Compensation Compensation Weight 74.8								
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation	Misc Services
1961	30.3	25.6	28.7	28.1	9.5					25.4	32.9
1962	30.6	26.5	30.1	28.9	10.2					26.5	33.5
1963	31.0	27.6	31.7	29.6	11.1					27.8	34.2
1964	31.4	28.6	33.1	30.3	12.3					29.1	35.0
1965	31.8	29.8	34.9	31.0	13.0					30.5	35.8
1966	32.6	31.1	36.9	31.8	15.0					32.3	36.5
1967	33.5	32.9	39.9	33.0	16.8					34.3	37.8
1968	34.6	34.9	41.8	34.7	18.9					36.6	39.2
1969	36.3	37.1	44.6	36.6	21.8					39.2	40.9
1970	38.5	39.5	47.7	38.8	24.7					42.1	42.8
1971	40.5	42.1	50.1	41.8	28.0					44.8	45.1
1972	41.9	44.3	52.0	44.9	31.1					47.1	47.8
1973	43.6	46.7	54.3	47.6	34.7					49.8	49.9
1974	47.5	49.9	57.2	50.6	38.6					52.8	52.2
1975	52.8	54.3	60.3	54.6	42.9					56.3	56.8
1976	56.5	57.8	63.5	59.0	47.8					60.0	59.1
1977	59.8	61.5	66.4	63.1	52.8					63.5	62.6
1978	63.8	65.7	69.9	68.1	58.4					67.6	66.6
1979	69.8	70.5	74.1	73.4	64.5					72.4	71.2
1980	79.1	77.5	79.4	80.2	72.6					78.4	77.0
1981	88.2	85.8	86.3	87.7	81.8					85.8	85.2
1982	95.8	93.9	93.7	94.6	91.5					93.5	94.2
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0	100.0
1984	103.7	104.8	104.7	105.1	108.3	104.7	104.5			105.4	104.9
1985	107.7	110.8	111.4	109.2	117.7	111.6	110.7			112.0	110.8
1986	110.8	116.3	118.2	112.8	127.7	118.4	117.7			118.8	115.1
1987	113.3	120.9	125.0	116.3	137.4	125.4	124.8			125.4	119.7
1988	118.0	126.2	130.9	120.6	147.2	131.6	129.9			131.7	123.0
1989	123.5	132.8	138.8	125.3	158.8	139.2	139.3			139.6	128.8
1990	129.4	140.8	147.6	130.3	171.4	147.7	150.6			148.3	134.0
1991	136.4	148.2	155.6	135.4	184.3	155.7	159.1			156.5	139.8

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

Appendix C: Higher Education Price Index, Personal Consumption, and Contracted Supplies and Equipment, 1961-2008, Including Contracted Services, Supplies and Equipment, and Professional and Non-Professional Services from 2002-2008

			Personal Compensation Compensation Weight 74.8								
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation	Misc Services
1992	140.8	153.5	160.8	140.2	194.3	161.1	163.6			162.4	145.7
1993	145.2	157.9	165.0	144.2	204.3	165.2	168.8			167.6	149.5
1994	148.8	163.3	170.3	148.2	213.6	170.1	175.6			173.3	154.8
1995	153.2	168.1	176.1	152.5	221.4	176.1	179.7			179.1	158.0
1996	157.4	173.0	181.7	157.3	224.5	181.2	188.3			184.1	163.8
1997	161.9	178.4	187.2	162.1	226.7	186.6	194.7			189.0	167.3
1998	164.8	184.7	193.5	168.0	236.7	192.9	200.9			195.8	172.8
1999	167.6	189.1	200.7	174.1	239.2	199.9	209.7			202.0	177.0
2000	172.5	196.9	208.4	180.4	254.6	207.3	219.6			210.8	182.9
2001	178.4	208.7	215.8	187.9	261.7	214.5	229.2	197.7	182.6	218.1	199.8
2002	181.6	212.7	225.0	198.7	277.1	222.7	236.4	205.4	189.6	228.7	205.8
2003	185.5	223.5	234.3	203.8	292.3	229.4	255.7	211.1	193.9	238.1	209.5
2004	189.6	231.7	239.2	208.9	312.8	234.2	263.3	217.1	197.6	245.6	216.4
2005	195.3	240.8	246.4	214.1	327.2	240.7	274.0	223.4	201.4	253.7	222.7
2006	202.7	253.1	254.9	219.4	343.7	248.2	287.7	229.5	205.5	262.9	228.8
2007	208.0	260.3	264.7	227.5	260.8	257.6	299.2	237.7	213.6	256.9	238.3
2008	215.7	273.2	275.3	234.7	380.7	268.1	314.0	245.1	220.5	285.1	246.4

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2					Subindices of Salaries and Professional Personnel Used for HEPI					
Year	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration/Inst Services	Library Personnel	Professional Salaries Total
1961	33.5	35.0	14.9	15.7	26.1						
1962	33.4	35.2	15.7	15.8	26.5						
1963	33.4	35.3	16.7	15.8	26.8						
1964	33.6	35.7	18.0	15.7	27.2						
1965	33.8	36.0	19.3	15.7	27.6						
1966	34.6	36.7	20.5	15.7	28.2						
1967	35.3	37.8	21.3	15.7	28.9						
1968	36.0	39.0	21.9	15.8	29.7						
1969	36.6	40.3	23.3	15.9	30.7						
1970	37.6	41.9	25.7	16.3	31.9						
1971	39.0	43.5	30.8	18.0	34.1						
1972	39.8	45.1	34.9	19.2	36.0						
1973	41.1	46.5	37.7	20.2	37.6						
1974	46.5	49.4	41.6	24.8	41.4						
1975	58.0	58.3	46.7	31.8	48.5						
1976	60.7	61.7	52.1	34.4	51.3						
1977	63.8	64.8	56.8	40.5	55.7						
1978	66.6	69.3	63.2	45.9	60.2						
1979	71.7	74.7	70.0	50.3	65.1						
1980	84.6	81.6	77.8	64.1	75.0						
1981	95.6	89.6	85.9	79.7	85.9	86.7	86.5	86,7	84.5	85.4	
1982	100.4	96.4	93.5	92.4	94.9	93.9	92.0	93.9	93.1	93.7	93.7
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1984	99.7	102.3	105.3	102.5	103.0	104.7	104.2	104.7	104.5	104.9	104.7
1985	103.0	104.8	111.3	105.3	107.1	111.6	110.3	111.6	110.7	113.3	111.4
1986	102.6	107.2	121.2	103.1	109.0	118.4	116.4	118.4	117.7	117.1	118.2
1987	99.0	108.9	132.9	91.0	107.4	125.4	122.0	125.4	124.8	121.5	125.0
1988	101.1	120.5	140.5	87.7	109.8	131.6	127.7	131.6	129.9	124.6	130.9
1989	108.3	115.1	153.5	85.3	112.8	139.2	124.9	139.2	139.3	133.1	138.8
1990	114.3	119.6	167.0	90.1	118.7	147.7	142.2	147.7	150.6	139.8	147.6
1991	116.4	123.3	179.8	92.4	123.3	155.7	149.2	155.7	159.1	146.8	155.6

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

Appendix C: Higher Education Price Index, Personal Consumption, and Contracted Supplies and Equipment, 1961-2008, Including Contracted Services, Supplies and Equipment, and Professional and Non-Professional Services from 2002-2008

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2					Subindices of Salaries and Professional Personnel Used for HEPI					
Year	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration/Inst Services	Library Personnel	Professional Salaries Total
1992	115.2	126.3	193.8	93.3	126.9	161.1	153.9	161.1	163.6	151.6	160.8
1993	113.2	128.6	203.4	94.7	129.4	165.2	157.6	165.2	168.8	155.5	165.0
1994	114.3	130.8	213.6	98.7	133.6	170.1	162.7	170.1	175.6	160.7	170.3
1995	115.7	133.5	220.2	96.8	135.3	176.1	171.0	176.1	179.7	167.1	176.1
1996	130.1	137.0	230.9	93.3	139.9	181.2	174.9	181.2	188.3	172.2	181.7
1997	128.6	139.3	253.4	106.1	147.2	186.6	180.8	186.6	194.7	176.6	187.2
1998	126.2	141.3	266.5	111.1	151.6	192.9	187.2	192.9	200.9	182.0	193.5
1999	123.2	143.3	282.1	100.5	150.8	199.9	193.7	199.9	209.7	188.8	200.7
2000	123.1	145.0	298.6	104.9	155.8	207.3	199.7	207.3	219.6	195.9	208.4
2001	131.8	147.3	317.4	169.9	172.2	214.5	207.7	214.5	229.2	198.6	215.8
2002	128.2			118.1	169.2	222.7			236.4		
2003	132.2			157.6	179.1	229.9			255.7		
2004	135.6			176.4	187.1	234.2			263.3		
2005	145.5			200.2	197.8	240.7			274.0		
2006	158.1			255.7	214.5	248.2			287.7		
2007	165.3			220.6	216.4	257.6			299.2		
2008	180.0			252.0	230.9	267.4			314.0		

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

	Subindexes of Salaries of Professional Personnel Used for HEPI			
Year	HEPI Faculty	HEPI Admin	HEPI Benefit	Supply/ Equip
1961				
1962				
1963				
1964				
1965				
1966				
1967				
1968				
1969				
1970				
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979				
1980				
1981				
1982				
1983	100.0	100.0	100.0	100.0
1984	104.7	104.5	108.3	103.0
1985	111.6	110.7	117.7	107.1
1986	118.4	117.7	127.7	109.0
1987	125.4	124.8	137.4	107.4
1988	131.6	129.9	147.2	109.8
1989	139.2	139.3	158.8	112.8
1990	147.7	150.6	171.4	118.7
1991	155.7	159.1	184.3	123.3

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

Subindexes of Salaries of Professional Personnel Used for HEPI

Year	HEPI Faculty	HEPI Admin	HEPI Benefit	Supply/ Equip
1992	161.1	163.6	194.3	126.9
1993	165.2	168.8	204.3	129.4
1994	170.1	175.6	213.6	133.6
1995	176.1	179.7	221.4	135.3
1996	181.2	188.3	224.5	139.9
1997	186.6	194.7	226.7	147.2
1998	192.9	200.9	236.7	151.6
1999	199.9	209.7	239.2	150.8
2000	207.3	219.6	254.6	155.8
2001	214.5	229.2	261.7	172.2
2002	222.7	236.4	277.1	
2003	229.9	255.7	292.3	
2004	234.2	263.3	312.8	
2005	240.7	271.0	327.2	
2006			343.7	
2007			360.8	
2008			374.2	

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update

Appendix D: Consumer Price Index, Higher Education Price Index, and Major Subcomponents, 1961 – 2001, Reindexed, 1961 = 100

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

Personal Compensation
Compensation Weight 74.8

Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation	Misc Services
1961	100.0	100.0	100.0	100.0	100.0					100.0	100.0
1962	101.0	103.5	104.9	102.8	107.4					104.3	101.8
1963	102.3	107.8	110.5	105.3	116.8					109.4	104.0
1964	103.6	111.7	115.3	107.8	129.5					114.6	106.4
1965	105.0	116.4	121.6	110.3	136.8					120.1	108.8
1966	107.6	121.5	128.6	113.2	157.9					127.2	110.9
1967	110.6	128.5	139.0	117.4	176.8					135.0	114.9
1968	114.2	136.3	145.6	123.5	198.9					144.1	119.1
1969	119.8	144.9	155.4	130.2	229.5					154.3	124.3
1970	127.1	154.3	166.2	138.1	260.0					165.7	130.1
1971	133.7	164.5	174.6	148.8	294.7					176.4	137.1
1972	138.3	173.0	181.2	159.8	327.4					185.4	145.3
1973	143.9	182.4	189.2	169.4	365.3					196.1	151.7
1974	156.8	194.9	199.3	180.1	406.3					207.9	158.7
1975	174.3	212.1	210.1	194.3	451.6					221.7	172.6
1976	186.5	225.8	221.3	210.0	503.2					236.2	179.6
1977	197.4	240.2	231.4	224.6	555.8					250.0	190.3
1978	210.6	256.6	243.6	242.3	614.7					266.1	202.4
1979	230.4	275.4	258.2	261.2	678.9					285.0	216.4
1980	261.1	302.7	276.7	285.4	764.2					308.7	234.0
1981	291.1	335.2	300.7	312.1	861.1					337.8	259.0
1982	316.2	366.8	326.5	336.7	963.2					368.1	286.3
1983	330.0	390.6	348.4	355.9	1052.6	100.0	100.0			393.7	304.0
1984	342.2	409.4	364.8	374.0	1140.0	104.7	104.5			415.0	318.8
1985	355.4	432.8	388.2	388.6	1238.9	111.6	110.7			440.9	336.8
1986	365.7	454.3	411.8	401.4	1344.2	118.4	117.7			467.7	349.8
1987	373.9	472.3	435.5	413.9	1446.3	125.4	124.8			493.7	363.8
1988	389.4	493.0	456.1	429.2	1549.5	131.6	129.9			518.5	373.9
1989	407.6	518.8	483.6	445.9	1671.6	139.2	139.3			549.6	391.5
1990	427.1	550.0	514.3	463.7	1804.2	147.7	150.6			583.9	407.3
1991	450.2	578.9	542.2	481.9	1940.0	155.7	159.1			616.1	424.9

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

			Personal Compensation Compensation Weight 74.8								
Year	CPI Index	HEPI Index	Professional Salaries	Non Professional Salaries	Fringe Benefits	Faculty	Admin	Clerical	Service Employees	Total Personal Compensation	Misc Services
1992	464.7	599.6	560.3	498.9	2045.3	161.1	163.6			639.4	442.9
1993	479.2	616.8	574.9	513.2	2150.5	165.2	168.8			659.8	454.4
1994	491.1	637.9	593.4	527.4	2248.4	170.1	175.6			682.3	470.5
1995	505.6	656.6	613.6	542.7	2330.5	176.1	179.7			705.1	480.2
1996	519.5	675.8	633.1	559.8	2363.2	181.2	188.3			724.8	497.9
1997	534.3	696.9	652.3	576.9	2386.3	186.6	194.7			744.1	508.5
1998	543.9	721.5	674.2	597.9	2491.6	192.9	200.9			770.9	525.2
1999	553.1	738.7	699.3	619.6	2517.9	199.9	209.7			795.3	538.0
2000	569.3	769.1	726.1	642.0	2680.0	207.3	219.6			829.9	555.9
2001	588.8	815.2	751.9	668.7	2754.7	214.5	229.2	197.7	182.6	858.7	607.3
2002	599.3	830.9	784.1	707.2	2916.8	222.7	236.4	205.4	189.6	900.3	625.5
2003	612.2	873.0	816.4	725.4	3076.8	229.4	255.7	211.1	193.9	937.5	636.8
2004	625.7	905.1	833.3	743.3	3292.6	234.2	263.3	217.1	197.6	967.1	657.8
2005	644.6	940.6	858.4	762.0	3444.2	240.7	274.0	223.4	201.4	998.7	676.9
2006	669.0	988.7	888.2	780.7	3617.9	248.2	287.7	229.5	205.5	1035.1	695.4
2007	686.5	1016.8	922.2	809.7	2745.3	257.6	299.2	237.7	213.6	1011.4	724.3
2008	711.9	1067.2	959.4	835.3	4007.4	268.1	314.0	245.1	220.5	1122.6	748.9

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2					Subindexes of Salaries of Professional Personnel Used for the HEPI					
Year	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration /Inst Services	Library Personnel	Professional Salaries
1961	100.0	100.0	100.0	100.0	100.0						
1962	99.7	100.6	105.4	100.6	101.5						
1963	99.7	100.9	112.1	100.6	102.7						
1964	100.3	102.0	120.8	100.0	104.2						
1965	100.9	102.9	129.5	100.0	105.7						
1966	103.3	104.9	137.6	100.0	108.0						
1967	105.4	108.0	143.0	100.0	110.7						
1968	107.5	111.4	147.0	100.6	113.8						
1969	109.3	115.1	156.4	101.3	117.6						
1970	112.2	119.7	172.5	103.8	122.2						
1971	116.4	124.3	206.7	114.6	130.7						
1972	118.8	128.9	234.2	122.3	137.9						
1973	122.7	132.9	253.0	128.7	144.1						
1974	138.8	141.1	279.2	158.0	158.6						
1975	173.1	166.6	313.4	202.5	185.8						
1976	181.2	176.3	349.7	219.1	196.6						
1977	190.4	185.1	381.2	258.0	213.4						
1978	198.8	198.0	424.2	292.4	230.7						
1979	214.0	213.4	469.8	320.4	249.4						
1980	252.5	233.1	522.1	408.3	287.4						
1981	285.4	256.0	576.5	507.6	329.1	86.7	86.5	86.7	84.5	85.4	
1982	299.7	275.4	627.5	588.5	363.6	93.9	92.0	93.9	93.1	93.7	93.7
1983	298.5	285.7	671.1	636.9	383.1	100.0	100.0	100.0	100.0	100.0	100.0
1984	297.6	292.3	706.7	652.9	394.6	104.7	104.2	104.7	104.5	104.9	104.7
1985	307.5	299.4	747.0	670.7	410.3	111.6	110.3	111.6	110.7	113.3	111.4
1986	306.3	306.3	813.4	656.7	417.6	118.4	116.4	118.4	117.7	117.1	118.2
1987	295.5	311.1	891.9	579.6	411.5	125.4	122.0	125.4	124.8	121.5	125.0
1988	301.8	344.3	943.0	558.6	420.7	131.6	127.7	131.6	129.9	124.6	130.9
1989	323.3	328.9	1030.2	543.3	432.2	139.2	124.9	139.2	139.3	133.1	138.8
1990	341.2	341.7	1120.8	573.9	454.8	147.7	142.2	147.7	150.6	139.8	147.6
1991	347.5	352.3	1206.7	588.5	472.4	155.7	149.2	155.7	159.1	146.8	155.6

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

	Contracted Services,Supplies and Equipment Contract Services Weight 25.2					Subindexes of Salaries of Professional Personnel Used for the HEPI					
Year	Supplies and Materials	Equipment	Library Acquisitions	Utilities	Total Contracted Services	HEPI Faculty	Grad Asst	Extension/ Public Service	Administration /Inst Services	Library Personnel	Professional Salaries
1992	343.9	360.9	1300.7	594.3	486.2	161.1	153.9	161.1	163.6	151.6	160.8
1993	337.9	367.4	1365.1	603.2	495.8	165.2	157.6	165.2	168.8	155.5	165.0
1994	341.2	373.7	1433.6	628.7	511.9	170.1	162.7	170.1	175.6	160.7	170.3
1995	345.4	381.4	1477.9	616.6	518.4	176.1	171.0	176.1	179.7	167.1	176.1
1996	388.4	391.4	1549.7	594.3	536.0	181.2	174.9	181.2	188.3	172.2	181.7
1997	383.9	398.0	1700.7	675.8	564.0	186.6	180.8	186.6	194.7	176.6	187.2
1998	376.7	403.7	1788.6	707.6	580.8	192.9	187.2	192.9	200.9	182.0	193.5
1999	367.8	409.4	1893.3	640.1	577.8	199.9	193.7	199.9	209.7	188.8	200.7
2000	367.5	414.3	2004.0	668.2	596.9	207.3	199.7	207.3	219.6	195.9	208.4
2001	393.4	420.9	2130.2	1082.2	659.8	214.5	207.7	214.5	229.2	198.6	215.8
2002	382.7			752.2	648.4	222.7			236.4		
2003	394.6			1003.8	686.2	229.9			255.7		
2004	404.8			1123.6	716.9	234.2			263.3		
2005	434.3			1275.2	757.9	240.7			274.0		
2006	471.9			1628.7	821.9	248.2			287.7		
2007	493.4			1405.1	829.1	257.6			299.2		
2008	537.3			1605.1	884.8	267.4			314.0		

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

	Subindices of HEPI Salaries and Professional Pesonnel		
Year	HEPI Faculty	HEPI Admin	HEPI Benefit
1961			
1962			
1963			
1964			
1965			
1966			
1967			
1968			
1969			
1970			
1971			
1972			
1973			
1974			
1975			
1976			
1977			
1978			
1979			
1980			
1981			
1982			
1983	100.0	100.0	100.0
1984	104.7	104.5	108.3
1985	111.6	110.7	117.7
1986	118.4	117.7	127.7
1987	125.4	124.8	137.4
1988	131.6	129.9	147.2
1989	139.2	139.3	158.8
1990	147.7	150.6	171.4
1991	155.7	159.1	184.3

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix D: Reindexed HEPI Index and Subcomponents
1961 = 100

	Subindices of HEPI Salaries and Professional Pesonnel		
Year	HEPI Faculty	HEPI Admin	HEPI Benefit
1992	161.1	163.6	194.3
1993	165.2	168.8	204.3
1994	170.1	175.6	213.6
1995	176.1	179.7	221.4
1996	181.2	188.3	224.5
1997	186.6	194.7	226.7
1998	192.9	200.9	236.7
1999	199.9	209.7	239.2
2000	207.3	219.6	254.6
2001	214.5	229.2	261.7
2002	222.7	236.4	277.1
2003	229.9	255.7	292.3
2004	234.2	263.3	312.8
2005	240.7	271.0	327.2
2006			343.7
2007			360.8
2008			374.2

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, CommonFund Institute. Reindexed by author.

Appendix E: National Income and Product Accounts, Personal Consumption Expenditures Index, 1929 – 2008

Line	Item	Item Code	1929
1	**Personal consumption expenditures**	**DPCERG3**	**10.513**
2	**Goods**	**DGDSRG3**	**16.290**
3	**Durable goods**	**DDURRG3**	**28.502**
4	**Motor vehicles and parts**	**DMOTRG3**	**11.946**
5	New motor vehicles (55)	DNMVRG3	18.129
6	Net purchases of used motor vehicles (56)	DNPVRG3	0.429
7	Motor vehicle parts and accessories (58)	DMVPRG3	37.451
8	**Furnishings and durable household equipment**	**DFDHRG3**	**24.634**
9	Furniture and furnishings (parts of 31 and 32)	DFFFRG3	19.619
10	Household appliances (part of 33)	DAPPRG3	61.915
11	Glassware, tableware, and household utensils (34)	DUTERG3	13.605
12	Tools and equipment for house and garden (35)	DTOORG3	25.366
13	**Recreational goods and vehicles**	**DREQRG3**	**203.641**
14	Video, audio, photographic, and information processing equipment and media (75, 76, and part of 93)	DVAPRG3	1,203.671
15	Sporting equipment, supplies, guns, and ammunition (part of 80)	DSPGRG3	43.645
16	Sports and recreational vehicles (79)	DWHLRG3	20.771
17	Recreational books (part of 90)	DRBKRG3	8.857
18	Musical instruments (part of 80)	DMSCRG3	78.974
19	**Other durable goods**	**DODGRG3**	**21.033**
20	Jewelry and watches (part of 119)	DJRYRG3	32.339
21	Therapeutic appliances and equipment (42)	DTAERG3	17.371
22	Educational books (96)	DEBKRG3	4.707
23	Luggage and similar personal items (part of 119)	DLUGRG3	21.249
24	Telephone and facsimile equipment (67)	DTCERG3	12.088
25	**Nondurable goods**	**DNDGRG3**	**12.225**
26	**Food and beverages purchased for off-premises consumption**	**DFXARG3**	**11.474**
27	Food and nonalcoholic beverages purchased for off-premises consumption (4)	DTFDRG3	10.136
28	Alcoholic beverages purchased for off-premises consumption (5)	DAOPRG3	.....
29	Food produced and consumed on farms (6)	DFFDRG3	18.713
30	**Clothing and footwear**	**DCLORG3**	**27.522**
31	Garments	DGARRG3	29.005
32	Women's and girls' clothing (10)	DWGCRG3	.....
33	Men's and boys' clothing (11)	DMBCRG3	.....
34	Children's and infants' clothing (12)	DCICRG3	.....
35	Other clothing materials and footwear (13 and 17)	DOCCRG3	20.684
36	**Gasoline and other energy goods**	**DGOERG3**	**6.777**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	Item	Item Code	1929
1	**Personal consumption expenditures**	**DPCERG3**	**10.513**
37	Motor vehicle fuels, lubricants, and fluids (59)	DMFLRG3	8.308
38	Fuel oil and other fuels (29)	DFULRG3	3.513
39	**Other nondurable goods**	**DONGRG3**	**11.311**
40	Pharmaceutical and other medical products (40 and 41)	DPHMRG3	15.035
41	Recreational items (parts of 80, 92, and 93)	DREIRG3	22.722
42	Household supplies (parts of 32 and 36)	DHOURG3	15.812
43	Personal care products (part of 118)	DOPCRG3	18.662
44	Tobacco (127)	DTOBRG3	4.028
45	Magazines, newspapers, and stationery (part of 90)	DNEWRG3	7.279
46	Net expenditures abroad by U.S. residents (131)	ZZZZZZ3	.....
47	**Services**	**DSERRG3**	**7.787**
48	**Household consumption expenditures (for services)**	**DHCERG3**	**7.514**
49	**Housing and utilities**	**DHUTRG3**	**13.077**
50	Housing	DHSGRG3	13.121
51	Rental of tenant-occupied nonfarm housing (20)	DTENRG3	13.581
52	Imputed rental of owner-occupied nonfarm housing (21)	DOWNRG3	13.698
53	Rental value of farm dwellings (22)	DFARRG3	10.106
54	Group housing (23)	DGRHRG3	10.579
55	Household utilities	DUTLRG3	12.946
56	Water supply and sanitation (25)	DWRSRG3	4.059
57	Electricity and gas	DELGRG3	16.565
58	Electricity (27)	DELCRG3	24.894
59	Natural gas (28)	DGHERG3	7.715
60	**Health care**	**DHLCRG3**	**2.939**
61	Outpatient services	DOUTRG3	4.317
62	Physician services (44)	DPHYRG3	4.118
63	Dental services (45)	DDENRG3	3.869
64	Paramedical services (46)	DPMSRG3	4.939
65	Hospital and nursing home services	DHPNRG3	1.859
66	Hospitals (51)	DHSPRG3	1.738
67	Nursing homes (52)	DNRSRG3	2.859
68	**Transportation services**	**DTRSRG3**	**8.957**
69	Motor vehicle services	DMVSRG3	9.881
70	Motor vehicle maintenance and repair (60)	DVMRRG3	8.881
71	Other motor vehicle services (61)	DOVSRG3	15.733

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	Item	Item Code	1929
1	**Personal consumption expenditures**	**DPCERG3**	**10.513**
72	Public transportation	DPUBRG3	9.277
73	Ground transportation (63)	DGRDRG3	5.543
74	Air transportation (64)	DAITRG3	34.337
75	Water transportation (65)	DWATRG3	25.064
76	**Recreation services**	**DRCARG3**	**7.711**
77	Membership clubs, sports centers, parks, theaters, and museums (82)	DRLSRG3	6.259
78	Audio-video, photographic, and information processing equipment services (parts of 77 and 93)	DAVPRG3	12.723
79	Gambling (91)	DGAMRG3	5.358
80	Other recreational services (81, 94, and part of 92)	DOTRRG3	9.733
81	**Food services and accommodations**	**DFSARG3**	**7.205**
82	Food services	DFSERG3	7.362
83	Purchased meals and beverages (102)	DPMBRG3	7.276
84	Food furnished to employees (including military) (103)	DFOORG3	7.682
85	Accommodations (104)	DACCRG3	7.073
86	**Financial services and insurance**	**DIFSRG3**	**5.774**
87	Financial services	DFNLRG3	6.075
88	Financial services furnished without payment (107)	DIMPRG3	4.878
89	Financial service charges, fees, and commissions (108)	DOFIRG3	9.224
90	Insurance	DINSRG3	4.390
91	Life insurance (110)	DLIFRG3	4.196
92	Net household insurance (111)	DFINRG3	1.844
93	Net health insurance (112)	DHINRG3	4.836
94	Net motor vehicle and other transportation insurance (116)	DTINRG3	4.253
95	**Other services**	**DOTSRG3**	**6.628**
96	Communication	DCOMRG3	28.643
97	Telecommunication services (71)	DTCSRG3	36.840
98	Postal and delivery services (68)	DPSSRG3	4.694
99	Internet access (72)	DINTRG3	.....
100	Education services	DTEDRG3	2.744
101	Higher education (97)	DHEDRG3	2.570
102	Nursery, elementary, and secondary schools (98)	DNEHRG3	2.107
103	Commercial and vocational schools (99)	DVEDRG3	5.641
104	Professional and other services (121)	DPRSRG3	3.388
105	Personal care and clothing services (14 and parts of 17 and 118)	DPERRG3	6.554
106	Social services and religious activities (120)	DSOCRG3	6.833

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	Item	Item Code	1929
1	**Personal consumption expenditures**	**DPCERG3**	**10.513**
107	Household maintenance (parts of 31, 33, and 36)	DHHMRG3	4.557
108	Net foreign travel	ZZZZZZ3	.....
109	Foreign travel by U.S. residents (129)	DFTRRG3	13.826
110	Less: Expenditures in the United States by nonresidents (130)	DEXFRG3	7.170
111	**Final consumption expenditures of nonprofit institutions serving households (NPISHs) \1**	**DNPIRG3**	**22.110**
112	Gross output of nonprofit institutions (133) \2\	DNPERG3	.....
113	Less: Receipts from sales of goods and services by nonprofit institutions (134) \3\	DNPSRG3	.....

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1	**10.068**	**8.991**	**7.930**	**7.649**	**7.995**	**8.190**	**8.265**	**8.566**	**8.372**	**8.291**	**8.361**	**8.879**
2	**15.424**	**13.300**	**11.461**	**11.368**	**12.489**	**12.816**	**12.865**	**13.328**	**12.791**	**12.599**	**12.710**	**13.751**
3	**26.834**	**23.960**	**21.111**	**20.598**	**21.835**	**21.712**	**21.836**	**22.736**	**22.719**	**22.444**	**22.670**	**24.348**
4	**11.508**	**10.735**	**10.074**	**9.444**	**9.891**	**9.745**	**9.791**	**10.037**	**10.435**	**10.196**	**10.212**	**11.101**
5	17.608	16.802	15.761	14.240	15.077	14.838	14.957	15.239	15.999	15.597	15.637	16.805
6	0.447	0.552	0.658	0.627	0.567	0.458	0.394	0.418	0.535	0.510	0.773	1.499
7	34.846	29.788	27.435	27.994	28.814	29.052	29.191	30.719	30.114	29.719	28.146	28.552
8	**23.688**	**21.038**	**18.156**	**18.208**	**19.678**	**19.803**	**19.938**	**21.271**	**20.888**	**20.732**	**20.933**	**22.501**
9	18.863	16.447	13.780	14.276	15.694	15.514	15.879	17.370	16.807	16.686	17.178	18.858
10	59.159	54.669	47.378	44.614	45.022	44.308	44.967	46.586	46.762	46.159	44.504	46.772
11	13.204	11.971	11.165	10.915	12.095	13.172	12.405	12.600	12.596	12.602	12.608	12.897
12	24.309	21.438	19.162	19.066	21.092	21.156	21.392	23.264	22.931	22.636	23.147	25.174
13	**169.626**	**134.450**	**110.509**	**103.062**	**106.919**	**105.803**	**104.616**	**107.277**	**106.848**	**104.313**	**105.930**	**108.131**
14	935.944	674.614	506.477	462.801	494.802	487.162	481.637	492.848	480.594	463.253	469.224	482.190
15	43.574	41.147	37.078	35.936	36.993	36.782	36.077	37.506	38.028	37.034	38.371	38.610
16	20.784	19.759	17.664	16.688	16.851	16.552	15.841	16.395	16.929	16.591	17.118	17.430
17	8.549	8.147	7.822	7.419	7.347	7.348	7.418	7.536	7.655	7.725	7.699	7.796
18	60.464	42.567	31.273	28.354	30.553	30.070	29.797	30.492	29.483	28.322	28.643	29.497
19	**20.652**	**19.719**	**17.727**	**17.774**	**18.449**	**18.095**	**18.479**	**18.649**	**18.037**	**18.187**	**18.724**	**20.373**
20	32.084	31.957	29.968	29.993	29.043	27.896	29.624	28.798	26.925	27.844	29.548	33.530
21	17.242	17.104	16.261	15.567	15.516	15.486	15.434	15.523	15.558	15.702	15.813	15.906
22	4.544	4.330	4.157	3.944	3.905	3.906	3.943	4.006	4.068	4.106	4.092	4.144
23	20.496	18.057	14.623	15.359	17.869	17.608	17.563	18.559	18.049	17.585	17.775	19.559
24	11.411	9.947	8.491	8.728	9.914	9.978	10.356	11.477	11.307	11.576	11.885	13.310
25	**11.592**	**9.912**	**8.501**	**8.459**	**9.356**	**9.662**	**9.695**	**10.032**	**9.541**	**9.392**	**9.472**	**10.268**
26	**10.737**	**8.672**	**7.093**	**7.132**	**8.017**	**8.641**	**8.655**	**8.920**	**8.245**	**8.164**	**8.212**	**9.078**
27	9.520	7.739	6.369	6.438	7.328	7.876	7.876	8.150	7.465	7.397	7.396	8.150
28	.....	.....	.....	16.495	15.690	15.351	15.163	15.316	15.465	15.616	15.997	16.991
29	16.931	12.880	9.964	9.558	11.017	14.094	14.661	15.147	12.799	12.070	12.394	15.552
30	**26.269**	**22.950**	**18.850**	**19.211**	**22.272**	**21.880**	**21.906**	**23.058**	**22.496**	**21.973**	**22.222**	**24.402**
31	27.757	24.331	19.888	20.545	24.193	23.796	23.785	25.054	24.350	23.732	23.989	26.544
32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	19.553	16.868	14.087	13.732	15.096	14.764	14.876	15.616	15.441	15.201	15.402	16.456
36	**6.555**	**5.826**	**5.688**	**5.566**	**5.870**	**5.820**	**5.976**	**6.095**	**5.986**	**5.780**	**5.787**	**6.054**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1	**10.068**	**8.991**	**7.930**	**7.649**	**7.995**	**8.190**	**8.265**	**8.566**	**8.372**	**8.291**	**8.361**	**8.879**
37	7.934	6.709	6.978	6.918	7.262	7.277	7.515	7.694	7.485	7.142	7.022	7.336
38	3.448	3.248	2.930	2.820	2.991	2.924	2.978	3.021	3.012	2.965	3.052	3.199
39	**10.912**	**10.396**	**9.820**	**9.328**	**9.564**	**9.553**	**9.507**	**9.843**	**9.683**	**9.590**	**9.766**	**10.068**
40	14.954	14.682	14.125	13.378	12.860	12.522	12.530	12.625	12.717	12.657	12.643	12.794
41	22.166	19.243	15.670	15.939	18.738	20.233	19.710	22.717	19.904	18.270	19.151	19.225
42	15.093	13.033	11.209	11.421	12.060	12.025	11.946	12.214	11.617	11.253	11.397	12.400
43	18.314	17.689	17.267	17.185	15.746	15.510	15.540	15.803	15.843	15.748	15.595	16.109
44	3.798	3.867	3.867	3.430	3.544	3.510	3.487	3.579	3.602	3.660	3.763	3.855
45	7.171	6.941	6.804	6.535	6.590	6.574	6.638	6.805	6.998	7.055	7.143	7.147
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**7.564**	**7.031**	**6.352**	**5.953**	**5.877**	**6.006**	**6.104**	**6.330**	**6.336**	**6.320**	**6.369**	**6.594**
48	**7.302**	**6.792**	**6.129**	**5.737**	**5.648**	**5.775**	**5.867**	**6.081**	**6.093**	**6.076**	**6.126**	**6.340**
49	**12.728**	**12.068**	**10.939**	**9.942**	**9.184**	**9.213**	**9.364**	**9.712**	**9.957**	**9.936**	**9.962**	**10.096**
50	12.748	12.023	10.765	9.661	8.810	8.851	9.051	9.474	9.773	9.767	9.799	9.966
51	13.220	12.516	11.239	10.495	9.047	9.047	9.260	9.686	10.005	10.005	10.047	10.217
52	13.332	12.624	11.334	9.768	9.145	9.124	9.339	9.768	10.090	10.091	10.133	10.304
53	9.613	8.651	7.463	6.944	7.287	7.781	7.889	8.316	8.458	8.383	8.341	8.500
54	10.371	9.816	8.962	8.049	7.584	7.578	7.726	8.095	8.310	8.386	8.282	8.408
55	12.771	12.557	12.310	12.028	11.904	11.858	11.681	11.567	11.484	11.366	11.358	11.298
56	4.059	4.059	3.926	3.573	3.617	3.794	3.794	3.794	3.794	3.750	3.838	3.794
57	16.285	15.947	15.683	15.583	15.337	15.072	14.790	14.608	14.477	14.333	14.239	14.185
58	24.106	23.184	22.487	22.229	21.610	20.964	20.287	19.860	19.561	19.241	19.033	18.915
59	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715
60	**2.947**	**2.740**	**2.414**	**2.379**	**2.466**	**2.608**	**2.662**	**2.734**	**2.788**	**2.769**	**2.856**	**2.928**
61	4.422	4.092	3.505	3.506	3.617	3.849	3.927	4.008	4.165	4.122	4.274	4.351
62	4.211	3.900	3.357	3.372	3.480	3.699	3.776	3.839	3.978	3.947	4.087	4.164
63	3.977	3.679	3.099	3.072	3.153	3.383	3.438	3.557	3.705	3.666	3.813	3.854
64	5.050	4.660	4.050	4.051	4.217	4.439	4.551	4.607	4.829	4.718	4.885	5.049
65	1.756	1.652	1.549	1.480	1.549	1.618	1.652	1.721	1.687	1.687	1.721	1.790
66	1.641	1.545	1.448	1.384	1.448	1.512	1.545	1.609	1.577	1.577	1.609	1.673
67	2.700	2.542	2.383	2.277	2.383	2.488	2.541	2.647	2.594	2.594	2.647	2.753
68	**8.885**	**8.437**	**7.785**	**7.340**	**7.485**	**7.650**	**7.607**	**7.564**	**7.619**	**7.647**	**7.511**	**7.649**
69	9.567	9.004	7.877	7.068	7.295	7.532	7.530	7.547	7.543	7.529	7.507	7.833
70	8.587	8.062	7.011	6.260	6.467	6.698	6.701	6.720	6.720	6.700	6.678	6.972
71	15.428	14.847	13.633	12.715	13.024	13.116	13.044	12.997	12.946	13.041	13.045	13.529

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1	**10.068**	**8.991**	**7.930**	**7.649**	**7.995**	**8.190**	**8.265**	**8.566**	**8.372**	**8.291**	**8.361**	**8.879**
72	9.308	8.872	8.369	8.055	8.169	8.309	8.243	8.165	8.254	8.308	8.096	8.133
73	5.565	5.304	5.003	4.815	4.887	4.970	4.929	4.883	4.941	4.970	4.846	4.867
74	23.826	23.748	20.970	20.918	17.767	18.718	18.734	18.751	16.531	17.805	16.747	16.930
75	24.509	24.639	24.496	24.320	24.829	24.450	24.892	24.892	23.709	24.099	23.896	24.731
76	**7.567**	**7.228**	**6.882**	**6.490**	**6.538**	**6.632**	**6.760**	**7.007**	**7.137**	**7.073**	**7.136**	**7.394**
77	6.179	5.914	5.635	5.277	5.298	5.367	5.488	5.684	5.788	5.743	5.813	6.017
78	11.761	10.855	10.078	9.751	10.007	10.274	10.383	10.809	10.921	10.787	10.831	11.024
79	5.330	5.046	4.807	4.896	5.059	5.154	5.057	5.360	5.723	5.528	5.370	5.959
80	9.587	9.555	9.436	9.277	9.413	9.470	9.603	9.811	9.752	9.805	9.829	9.950
81	**6.762**	**5.834**	**4.925**	**4.763**	**5.126**	**5.512**	**5.521**	**5.717**	**5.449**	**5.339**	**5.401**	**5.889**
82	6.886	5.897	4.948	4.813	5.231	5.652	5.655	5.852	5.554	5.431	5.502	6.023
83	6.795	5.831	4.893	4.761	5.168	5.581	5.578	5.772	5.485	5.364	5.435	5.877
84	7.309	6.102	5.115	4.955	5.471	5.954	6.040	6.245	5.824	5.697	5.761	7.284
85	6.934	6.563	5.992	5.381	5.071	5.066	5.165	5.412	5.556	5.607	5.537	5.621
86	**5.640**	**5.129**	**4.565**	**4.354**	**4.509**	**4.704**	**4.916**	**5.131**	**5.009**	**4.972**	**5.113**	**5.248**
87	5.917	5.339	4.756	4.498	4.469	4.905	5.172	5.393	5.268	5.207	5.453	5.590
88	4.525	3.742	3.002	2.735	2.695	3.106	3.368	3.556	3.330	3.276	3.493	3.620
89	9.488	9.628	9.959	9.823	9.846	10.163	10.346	10.613	11.012	10.964	11.141	11.187
90	4.304	3.942	3.506	3.365	3.585	3.623	3.765	3.932	3.836	3.818	3.885	3.991
91	4.070	3.776	3.315	3.105	3.273	3.315	3.441	3.608	3.483	3.440	3.524	3.650
92	1.769	1.675	1.653	1.692	1.753	1.802	1.776	1.849	1.799	1.783	1.818	1.937
93	4.890	3.863	3.315	3.667	4.452	4.623	5.074	5.422	5.501	5.543	5.538	5.515
94	4.327	4.387	4.417	4.398	4.446	4.282	4.218	4.160	4.120	4.213	4.238	4.349
95	**6.394**	**5.928**	**5.452**	**5.206**	**5.283**	**5.343**	**5.427**	**5.700**	**5.660**	**5.726**	**5.773**	**6.039**
96	28.638	28.487	28.454	28.437	28.274	28.267	28.063	27.951	27.800	27.713	27.851	28.251
97	37.104	37.242	37.311	37.131	36.606	36.390	36.189	35.701	35.700	35.652	35.719	35.901
98	4.505	4.254	4.176	4.275	4.450	4.583	4.509	4.717	4.567	4.513	4.608	4.901
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100	2.752	2.631	2.564	2.325	2.368	2.351	2.370	2.425	2.439	2.445	2.441	2.555
101	2.569	2.469	2.345	2.171	2.220	2.196	2.221	2.270	2.295	2.295	2.270	2.345
102	2.055	1.951	2.080	1.769	1.795	1.795	1.795	1.847	1.847	1.847	1.873	2.003
103	5.798	5.528	5.155	4.778	4.843	4.812	4.858	4.949	4.955	5.018	5.013	5.256
104	3.280	3.017	2.750	2.584	2.614	2.689	2.770	2.889	2.859	2.880	2.914	3.091
105	6.505	6.354	5.994	5.725	5.752	5.712	5.670	5.960	6.074	6.061	6.058	6.260
106	6.554	6.038	5.654	5.532	5.819	5.913	6.071	6.393	6.272	6.272	6.281	6.487

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
1	**10.068**	**8.991**	**7.930**	**7.649**	**7.995**	**8.190**	**8.265**	**8.566**	**8.372**	**8.291**	**8.361**	**8.879**
107	4.236	3.717	3.220	3.017	3.097	3.174	3.297	3.618	3.433	3.513	3.609	3.875
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	12.793	10.669	8.812	9.032	9.469	9.899	10.286	10.582	10.800	11.586	11.582	11.369
110	7.162	6.589	6.091	5.716	6.261	6.756	7.088	7.203	6.651	6.409	6.760	6.779
111	**21.266**	**19.443**	**18.068**	**17.389**	**18.346**	**18.484**	**18.984**	**19.977**	**19.449**	**19.481**	**19.456**	**20.397**
112	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
113	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**9.984**	**10.902**	**11.529**	**11.989**	**12.825**	**14.126**	**14.925**	**14.811**	**14.989**	**16.009**	**16.337**	**16.555**
2	**16.023**	**17.863**	**19.052**	**19.922**	**21.443**	**24.024**	**25.443**	**24.853**	**24.933**	**26.944**	**27.204**	**27.080**
3	**28.503**	**31.091**	**34.951**	**36.969**	**38.496**	**41.870**	**44.011**	**44.312**	**44.538**	**47.522**	**47.818**	**47.443**
4	**14.221**	**14.978**	**16.087**	**16.347**	**20.462**	**22.484**	**24.221**	**25.069**	**25.139**	**26.425**	**27.513**	**26.993**
5	19.998	21.255	23.890	18.637	21.844	24.750	27.065	29.647	29.845	31.118	33.977	34.261
6	2.725	2.935	3.121	3.400	6.932	7.443	8.023	6.456	6.156	6.345	5.273	4.106
7	32.718	33.682	36.044	36.099	36.947	38.283	39.043	38.949	40.026	45.222	45.140	44.523
8	**26.014**	**29.744**	**34.169**	**37.074**	**37.213**	**39.831**	**41.508**	**40.524**	**41.234**	**45.442**	**44.986**	**45.064**
9	22.010	25.517	29.732	32.782	32.893	35.083	36.502	35.203	36.248	40.670	39.757	39.741
10	53.853	59.766	63.713	67.307	67.167	73.872	78.031	75.759	74.814	80.167	80.107	79.555
11	14.528	16.344	18.432	19.165	19.034	19.505	19.851	20.531	21.274	23.294	23.852	24.459
12	28.624	31.047	34.022	35.623	37.574	41.558	43.403	42.272	43.088	47.283	46.463	47.108
13	**123.146**	**123.323**	**134.212**	**137.900**	**141.370**	**163.182**	**172.637**	**179.146**	**177.569**	**181.246**	**174.947**	**172.724**
14	571.658	572.918	622.270	625.816	636.641	773.193	818.350	856.796	850.292	847.908	786.148	763.197
15	43.909	41.927	48.814	51.130	52.269	56.535	59.139	59.309	58.027	62.714	62.799	62.737
16	19.533	17.930	20.482	21.153	21.914	24.273	25.136	25.437	24.764	26.800	27.230	27.141
17	7.822	8.409	8.644	8.975	9.303	10.055	10.998	11.726	11.893	12.176	12.952	13.520
18	35.276	35.632	38.460	38.453	38.860	47.918	51.016	53.843	53.515	52.998	48.723	47.159
19	**23.499**	**24.679**	**27.554**	**28.645**	**28.633**	**30.256**	**30.594**	**30.444**	**30.006**	**31.848**	**31.774**	**31.920**
20	40.893	42.021	47.813	48.843	47.284	50.390	48.801	48.520	47.064	50.364	50.039	50.511
21	16.064	16.567	16.921	17.121	17.495	18.262	19.050	19.625	19.801	20.713	20.971	20.782
22	4.157	4.469	4.595	4.770	4.945	5.344	5.845	6.232	6.321	6.471	6.884	7.186
23	23.315	25.680	29.933	32.685	33.956	35.460	37.370	35.959	35.571	37.933	37.181	37.124
24	15.552	18.230	21.630	24.045	23.771	23.599	23.565	22.782	23.332	25.672	25.365	25.676
25	**11.950**	**13.370**	**14.148**	**14.769**	**16.002**	**18.069**	**19.178**	**18.557**	**18.605**	**20.198**	**20.416**	**20.345**
26	**10.856**	**12.502**	**12.836**	**13.227**	**14.601**	**16.814**	**17.647**	**16.939**	**17.024**	**18.814**	**19.271**	**18.897**
27	9.794	11.300	11.369	11.711	13.149	15.478	16.437	15.820	16.026	17.806	18.149	17.806
28	19.362	21.503	24.207	24.703	25.626	26.366	25.992	25.645	25.037	25.963	27.944	27.484
29	19.684	23.979	24.384	25.760	27.623	31.997	33.051	28.678	27.135	31.995	31.755	30.541
30	**29.235**	**32.671**	**36.897**	**40.113**	**43.437**	**46.900**	**49.782**	**47.637**	**47.257**	**51.386**	**50.517**	**50.398**
31	31.986	36.155	41.580	45.667	49.253	52.345	55.372	52.702	52.031	56.183	55.309	55.232
32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
34	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	19.358	20.931	22.374	23.561	25.867	29.657	31.901	31.173	31.472	35.095	34.318	34.100
36	**6.412**	**6.637**	**6.778**	**6.768**	**7.035**	**7.906**	**9.000**	**9.133**	**9.235**	**9.491**	**9.663**	**10.033**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**9.984**	**10.902**	**11.529**	**11.989**	**12.825**	**14.126**	**14.925**	**14.811**	**14.989**	**16.009**	**16.337**	**16.555**
37	7.680	7.755	7.770	7.710	7.904	8.860	9.936	10.145	10.160	10.369	10.579	11.027
38	3.442	3.642	3.767	3.779	3.987	4.496	5.227	5.252	5.398	5.616	5.696	5.865
39	**11.005**	**11.748**	**12.429**	**12.853**	**13.447**	**15.300**	**16.150**	**15.798**	**15.868**	**16.901**	**16.966**	**17.218**
40	13.107	13.182	13.283	13.378	13.650	14.757	15.631	15.883	16.079	16.659	16.875	17.006
41	23.490	26.297	29.710	30.983	32.022	35.013	38.584	37.562	37.103	39.414	40.716	39.940
42	14.891	16.368	17.916	18.902	20.185	25.706	26.840	23.754	23.661	26.104	24.328	24.282
43	17.496	17.796	18.589	18.912	19.731	23.573	24.261	23.458	22.846	25.274	24.509	24.616
44	3.970	4.223	4.362	4.557	4.707	5.064	5.259	5.374	5.478	5.651	5.904	6.191
45	7.568	8.142	8.541	8.664	8.950	9.779	10.635	11.095	11.353	11.852	12.390	12.765
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**7.059**	**7.501**	**7.845**	**8.102**	**8.594**	**9.220**	**9.707**	**9.872**	**10.126**	**10.625**	**11.013**	**11.441**
48	**6.784**	**7.205**	**7.536**	**7.782**	**8.244**	**8.820**	**9.277**	**9.438**	**9.676**	**10.142**	**10.524**	**10.940**
49	**10.310**	**10.365**	**10.445**	**10.554**	**10.731**	**11.075**	**11.666**	**12.004**	**12.368**	**12.844**	**13.340**	**13.947**
50	10.220	10.285	10.374	10.499	10.743	11.150	11.837	12.229	12.647	13.201	13.764	14.467
51	10.430	10.452	10.473	10.516	10.580	10.920	11.644	12.155	12.581	13.092	13.624	14.347
52	10.542	10.541	10.562	10.605	10.670	11.013	11.742	12.258	12.687	13.203	13.739	14.490
53	9.052	9.680	10.525	11.629	14.072	15.360	15.620	14.331	14.674	15.896	17.017	17.159
54	8.874	9.246	9.384	9.502	9.717	10.230	10.838	11.307	11.679	12.448	12.989	13.576
55	11.288	11.280	11.315	11.332	11.144	11.158	11.270	11.343	11.454	11.575	11.781	11.961
56	3.838	3.838	3.927	4.015	4.103	4.280	4.412	4.456	4.720	4.897	5.338	5.647
57	14.130	14.118	14.099	14.054	13.705	13.601	13.680	13.759	13.771	13.853	13.932	14.045
58	18.798	18.771	18.729	18.633	17.899	17.684	17.849	18.013	18.037	18.205	18.369	18.603
59	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715	7.715
60	**3.115**	**3.362**	**3.611**	**3.772**	**4.092**	**4.533**	**4.789**	**4.856**	**4.959**	**5.186**	**5.441**	**5.699**
61	4.603	4.986	5.332	5.485	5.761	6.102	6.367	6.439	6.482	6.647	6.974	7.345
62	4.397	4.786	5.097	5.222	5.469	5.764	5.998	6.029	6.060	6.215	6.557	6.899
63	4.111	4.395	4.745	4.948	5.242	5.623	5.917	6.093	6.159	6.319	6.525	6.899
64	5.272	5.772	6.160	6.270	6.547	6.936	7.213	7.270	7.325	7.493	7.880	8.267
65	1.928	2.065	2.238	2.410	2.788	3.374	3.649	3.718	3.890	4.200	4.406	4.578
66	1.802	1.931	2.092	2.253	2.606	3.154	3.411	3.475	3.636	3.926	4.119	4.280
67	2.965	3.177	3.442	3.706	4.289	5.189	5.612	5.718	5.983	6.460	6.777	7.042
68	**8.114**	**8.296**	**8.251**	**8.357**	**8.639**	**9.282**	**9.957**	**10.641**	**11.120**	**11.914**	**12.358**	**12.936**
69	8.497	8.544	8.650	8.715	9.022	9.755	10.322	10.615	10.830	11.609	11.983	12.647
70	7.584	7.665	7.772	7.833	8.086	8.757	9.241	9.471	9.680	10.396	10.669	11.235
71	14.375	13.920	13.932	13.994	14.875	15.837	17.170	18.217	18.295	19.321	20.785	22.288

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**9.984**	**10.902**	**11.529**	**11.989**	**12.825**	**14.126**	**14.925**	**14.811**	**14.989**	**16.009**	**16.337**	**16.555**
72	8.542	8.773	8.688	8.814	9.105	9.743	10.556	11.637	12.422	13.303	13.870	14.384
73	5.109	5.246	5.192	5.274	5.462	5.841	6.317	6.986	7.487	8.048	8.409	8.750
74	18.529	19.347	20.406	19.047	17.863	19.424	22.219	22.593	22.219	22.430	22.697	22.672
75	25.276	25.997	27.037	27.020	27.028	26.979	28.513	27.508	27.220	27.220	27.220	26.621
76	**7.786**	**8.361**	**9.390**	**9.857**	**10.495**	**11.306**	**11.718**	**11.927**	**12.024**	**12.423**	**12.876**	**13.465**
77	6.315	6.823	7.768	8.189	8.620	9.149	9.352	9.514	9.592	9.889	10.117	10.543
78	11.785	12.428	13.099	13.438	14.075	15.761	16.307	16.668	17.284	18.433	19.535	20.669
79	6.436	6.673	7.195	7.540	9.333	10.950	12.744	13.035	12.507	12.253	13.383	14.086
80	10.400	10.769	11.416	11.685	12.238	13.140	13.857	13.798	13.834	14.466	14.859	15.167
81	**6.883**	**7.722**	**8.053**	**8.322**	**9.257**	**10.333**	**10.803**	**10.513**	**10.698**	**11.502**	**11.760**	**11.658**
82	7.073	7.959	8.309	8.592	9.585	10.725	11.207	10.871	11.055	11.890	12.145	12.011
83	6.800	7.631	7.957	8.197	9.441	10.587	11.021	10.682	10.805	11.505	11.765	11.719
84	9.562	10.914	11.443	11.983	11.372	12.472	13.556	13.269	14.274	16.793	17.017	15.877
85	5.933	6.181	6.274	6.353	6.497	6.839	7.246	7.560	7.808	8.323	8.685	9.077
86	**5.605**	**5.860**	**6.103**	**6.335**	**7.005**	**7.303**	**7.685**	**7.824**	**7.976**	**8.074**	**8.566**	**9.539**
87	5.868	6.170	6.561	6.711	7.665	8.291	8.696	9.078	9.476	9.835	10.134	11.712
88	3.868	4.189	4.603	4.806	5.776	6.246	6.517	6.841	7.408	7.804	8.095	9.928
89	11.317	11.251	11.326	11.231	11.853	12.826	13.594	14.041	13.725	13.895	14.141	14.396
90	4.304	4.484	4.610	4.831	5.217	5.291	5.580	5.586	5.603	5.577	6.025	6.553
91	3.944	4.196	4.447	4.574	4.909	5.119	5.497	5.748	6.042	6.462	6.672	7.007
92	2.056	2.213	2.361	2.421	2.522	2.810	2.993	3.083	3.157	3.362	3.568	3.672
93	6.091	6.375	6.207	6.906	7.406	7.047	6.841	5.795	5.389	4.440	4.971	5.750
94	4.469	4.094	4.020	4.014	4.567	4.645	5.384	6.163	5.979	6.157	7.012	7.680
95	**6.576**	**7.341**	**8.109**	**8.620**	**9.019**	**9.637**	**10.119**	**10.344**	**10.595**	**11.138**	**11.547**	**11.974**
96	29.855	31.035	32.143	32.727	32.958	34.016	35.848	37.297	39.821	40.915	42.592	44.037
97	37.878	39.098	40.241	40.911	40.909	41.541	43.667	45.540	49.008	50.032	51.893	53.711
98	5.223	5.633	6.018	6.170	6.426	7.162	7.640	7.854	8.035	8.553	9.085	9.337
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100	2.695	2.947	3.152	3.266	3.503	3.814	4.088	4.157	4.249	4.493	4.542	4.616
101	2.470	2.670	2.844	2.994	3.194	3.393	3.567	3.617	3.692	3.868	3.892	3.916
102	2.106	2.287	2.493	2.621	2.825	3.157	3.512	3.587	3.714	3.991	4.091	4.242
103	5.574	6.247	6.603	6.510	7.020	7.840	8.410	8.568	8.642	9.151	9.180	9.285
104	3.273	3.464	3.823	4.105	4.200	4.646	4.896	5.062	5.209	5.542	5.852	6.107
105	6.855	7.477	8.084	8.304	8.785	9.525	10.000	10.202	10.368	11.099	11.370	11.697
106	6.989	7.394	7.666	7.903	8.658	9.993	10.702	10.763	11.153	12.002	12.075	12.318

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
1	**9.984**	**10.902**	**11.529**	**11.989**	**12.825**	**14.126**	**14.925**	**14.811**	**14.989**	**16.009**	**16.337**	**16.555**
107	4.475	5.666	6.844	7.714	8.240	8.639	8.907	8.956	9.013	9.500	10.136	10.582
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	11.271	11.439	12.116	15.072	15.804	15.435	16.497	16.934	16.776	16.398	16.174	17.319
110	7.381	6.782	6.945	7.452	8.937	10.302	11.042	11.025	11.169	12.018	12.329	12.492
111	**22.132**	**23.742**	**24.826**	**25.684**	**28.332**	**32.957**	**35.502**	**35.806**	**37.233**	**40.352**	**40.438**	**41.166**
112	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
113	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	**16.697**	**16.764**	**17.100**	**17.620**	**18.035**	**18.305**	**18.606**	**18.801**	**19.023**	**19.245**	**19.527**	**19.810**
2	**26.979**	**26.821**	**27.277**	**28.130**	**28.770**	**28.917**	**29.144**	**29.253**	**29.404**	**29.648**	**29.971**	**30.286**
3	**46.403**	**46.224**	**47.338**	**49.080**	**49.971**	**50.765**	**50.573**	**50.701**	**50.919**	**51.114**	**51.344**	**50.923**
4	**26.059**	**26.361**	**27.558**	**29.295**	**30.403**	**31.911**	**31.314**	**31.491**	**32.004**	**32.256**	**32.519**	**32.253**
5	34.813	31.477	33.147	35.055	36.325	37.903	37.413	37.421	37.269	37.046	36.950	36.123
6	1.433	7.607	7.795	8.908	9.555	10.737	10.333	11.043	12.545	13.495	14.504	14.943
7	43.560	43.671	44.223	44.606	44.735	44.446	43.091	41.831	41.922	42.603	42.631	44.249
8	**44.851**	**44.519**	**44.886**	**45.641**	**45.546**	**45.574**	**45.976**	**46.131**	**46.076**	**46.098**	**46.149**	**45.852**
9	39.566	39.487	40.259	41.212	41.273	41.289	41.942	42.419	42.519	42.629	42.794	42.812
10	78.307	75.755	72.266	71.269	69.531	69.357	68.412	67.015	65.468	64.228	63.510	62.020
11	24.794	25.266	27.354	28.831	29.654	29.646	30.577	30.956	31.754	32.816	33.421	33.408
12	47.627	48.783	50.783	52.845	54.013	55.545	55.925	57.530	58.499	58.777	58.364	57.322
13	**167.176**	**161.959**	**163.788**	**169.564**	**174.207**	**169.191**	**170.344**	**169.432**	**167.575**	**167.240**	**165.214**	**162.937**
14	726.121	692.088	695.081	719.277	733.830	701.399	702.212	690.831	670.293	661.644	659.220	638.567
15	61.889	61.316	62.977	64.120	65.617	64.437	65.054	65.605	66.163	66.411	63.787	63.794
16	26.865	26.116	26.711	27.365	28.149	27.538	28.169	28.067	28.347	28.718	28.915	29.015
17	13.661	13.921	14.108	15.122	16.086	16.348	16.435	16.561	16.671	16.907	16.459	16.801
18	44.636	42.354	42.474	44.039	44.896	42.751	43.699	44.441	45.200	45.780	45.529	45.182
19	**31.262**	**30.869**	**31.192**	**31.397**	**31.436**	**31.584**	**31.671**	**31.605**	**31.472**	**31.637**	**32.448**	**32.282**
20	48.903	47.455	47.775	47.018	46.423	46.439	46.423	46.397	46.424	46.692	49.563	48.179
21	20.636	20.944	21.294	22.110	22.421	22.716	23.041	23.320	23.359	23.357	23.491	23.749
22	7.261	7.399	7.498	8.038	8.550	8.689	8.731	8.725	8.547	8.537	8.540	8.959
23	36.449	36.116	36.533	36.797	36.840	36.953	36.915	36.356	35.916	36.294	35.988	36.209
24	25.262	25.303	26.377	27.026	27.643	28.215	28.380	28.363	27.785	27.751	27.760	29.131
25	**20.396**	**20.263**	**20.554**	**21.157**	**21.671**	**21.704**	**21.963**	**22.055**	**22.175**	**22.396**	**22.695**	**23.104**
26	**18.886**	**18.541**	**18.677**	**19.242**	**20.045**	**19.838**	**20.004**	**20.105**	**20.257**	**20.470**	**20.883**	**21.305**
27	17.806	17.464	17.601	18.149	18.971	18.755	18.911	19.011	19.158	19.374	19.817	20.231
28	28.092	27.936	28.205	28.819	28.979	29.242	29.703	29.804	29.944	30.236	30.411	30.592
29	28.026	27.054	26.571	27.543	29.407	27.772	27.026	27.063	27.538	26.739	25.862	28.526
30	**50.523**	**50.386**	**51.343**	**52.107**	**52.330**	**52.777**	**53.484**	**53.793**	**53.954**	**54.428**	**54.941**	**55.419**
31	55.142	54.834	55.555	56.228	56.353	56.449	56.970	57.252	57.293	57.783	58.387	58.793
32	.....	.....	.....	.....	.....	66.080	66.375	66.492	66.389	66.814	67.375	67.648
33	.....	.....	.....	.....	.....	47.084	47.922	48.497	48.761	49.379	50.086	50.689
34	.....	.....	.....	.....	.....	33.806	33.677	32.481	31.841	31.831	31.943	32.106
35	34.783	35.110	36.634	37.595	38.063	39.415	40.589	40.955	41.446	41.845	42.065	42.740
36	**10.196**	**10.304**	**10.626**	**11.115**	**10.991**	**11.146**	**11.344**	**11.357**	**11.415**	**11.443**	**11.337**	**11.724**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	**16.697**	**16.764**	**17.100**	**17.620**	**18.035**	**18.305**	**18.606**	**18.801**	**19.023**	**19.245**	**19.527**	**19.810**
37	11.266	11.385	11.729	12.237	12.117	12.289	12.644	12.520	12.598	12.568	12.486	12.958
38	5.890	5.953	6.154	6.477	6.383	6.473	6.378	6.614	6.622	6.747	6.624	6.769
39	**17.264**	**17.443**	**17.741**	**18.310**	**18.752**	**19.057**	**19.353**	**19.400**	**19.464**	**19.734**	**20.027**	**20.305**
40	17.164	17.338	17.729	18.271	18.894	19.178	19.136	18.665	18.122	17.808	17.719	17.655
41	38.960	39.885	39.760	40.584	41.097	41.164	41.912	42.584	43.290	43.915	44.833	44.883
42	24.484	24.532	24.745	25.397	25.812	26.009	26.289	26.224	26.143	26.247	26.239	26.343
43	24.534	24.734	25.504	26.317	27.414	27.611	27.590	27.527	27.783	27.873	27.908	27.799
44	6.238	6.295	6.422	6.629	6.756	7.023	7.257	7.315	7.373	7.597	7.777	8.107
45	12.865	13.227	13.562	14.350	15.016	15.237	15.495	15.727	15.987	16.671	17.578	18.112
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**11.728**	**11.931**	**12.217**	**12.575**	**12.883**	**13.230**	**13.581**	**13.827**	**14.090**	**14.306**	**14.573**	**14.846**
48	**11.215**	**11.406**	**11.671**	**12.007**	**12.300**	**12.636**	**13.014**	**13.252**	**13.507**	**13.714**	**13.977**	**14.234**
49	**14.326**	**14.547**	**14.767**	**15.030**	**15.318**	**15.565**	**15.859**	**16.070**	**16.243**	**16.416**	**16.562**	**16.703**
50	14.906	15.122	15.380	15.668	15.982	16.252	16.511	16.739	16.944	17.152	17.327	17.499
51	14.857	15.071	15.347	15.624	15.922	16.141	16.380	16.592	16.797	16.984	17.134	17.310
52	14.984	15.199	15.478	15.757	16.058	16.276	16.526	16.731	16.926	17.114	17.279	17.445
53	16.532	16.791	16.649	17.100	17.770	19.292	19.883	20.726	21.153	21.999	22.627	22.890
54	14.000	14.373	14.818	15.379	15.795	16.170	16.418	16.531	16.712	16.952	17.108	17.361
55	12.088	12.330	12.393	12.558	12.744	12.903	13.330	13.478	13.527	13.563	13.596	13.622
56	5.956	6.529	6.706	7.235	7.676	7.988	8.241	8.458	8.675	8.940	9.073	9.296
57	14.091	14.203	14.226	14.270	14.381	14.498	14.982	15.111	15.111	15.077	15.080	15.046
58	18.698	18.933	18.981	19.076	19.316	19.572	19.862	19.936	19.936	19.862	19.795	19.721
59	7.715	7.715	7.715	7.715	7.715	7.715	8.202	8.333	8.333	8.332	8.379	8.379
60	**5.897**	**6.104**	**6.322**	**6.584**	**6.840**	**7.035**	**7.508**	**7.678**	**7.872**	**8.095**	**8.371**	**8.631**
61	7.656	7.954	8.275	8.579	8.867	9.161	9.377	9.560	9.840	10.074	10.340	10.677
62	7.179	7.504	7.832	8.158	8.437	8.717	8.929	9.139	9.404	9.617	9.883	10.200
63	7.211	7.360	7.588	7.777	8.005	8.208	8.371	8.417	8.659	8.894	9.136	9.434
64	8.658	9.045	9.433	9.768	10.156	10.641	10.915	11.180	11.523	11.796	12.057	12.467
65	4.682	4.819	4.957	5.198	5.439	5.560	6.282	6.448	6.580	6.803	7.100	7.308
66	4.376	4.505	4.634	4.859	5.084	5.198	5.905	6.062	6.188	6.390	6.672	6.869
67	7.201	7.413	7.624	7.995	8.366	8.552	8.963	9.178	9.349	9.744	10.141	10.424
68	**13.371**	**13.691**	**14.155**	**14.680**	**15.100**	**15.543**	**15.891**	**16.355**	**16.707**	**16.779**	**17.000**	**17.294**
69	13.070	13.327	13.791	14.287	14.573	14.903	15.141	15.499	15.682	15.853	16.027	16.326
70	11.635	11.888	12.348	12.789	12.999	13.276	13.508	13.862	14.043	14.216	14.390	14.686
71	22.700	22.825	23.007	23.877	24.981	25.780	25.911	26.030	26.115	26.110	26.178	26.306

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	**16.697**	**16.764**	**17.100**	**17.620**	**18.035**	**18.305**	**18.606**	**18.801**	**19.023**	**19.245**	**19.527**	**19.810**
72	14.873	15.312	15.812	16.426	17.122	17.819	18.415	19.136	19.893	19.732	20.076	20.369
73	9.092	9.411	9.763	10.203	10.588	11.019	11.293	11.657	12.075	12.251	12.566	12.803
74	22.335	22.023	22.005	22.008	23.525	24.493	26.209	27.917	29.356	27.238	27.115	27.235
75	26.825	26.621	26.835	26.835	26.835	27.786	28.894	29.525	29.940	30.698	31.043	32.009
76	**14.050**	**14.519**	**14.952**	**15.505**	**16.090**	**16.475**	**17.087**	**17.560**	**17.978**	**18.367**	**18.881**	**19.266**
77	11.045	11.489	11.804	12.247	12.712	13.032	13.725	14.278	14.756	15.227	15.863	16.377
78	21.663	22.307	23.171	23.995	24.970	25.524	25.883	26.142	26.374	26.500	26.632	26.496
79	14.345	14.435	14.797	15.456	16.015	16.456	16.699	16.879	17.078	17.292	17.521	17.794
80	15.318	15.432	15.855	16.121	16.453	16.567	16.877	17.029	17.299	17.512	17.975	18.514
81	**11.789**	**11.762**	**11.896**	**12.288**	**12.600**	**13.050**	**13.403**	**13.672**	**14.012**	**14.315**	**14.537**	**14.823**
82	12.135	12.090	12.215	12.615	12.933	13.404	13.775	14.058	14.422	14.751	14.984	15.281
83	11.948	12.017	12.217	12.631	12.930	13.408	13.780	14.062	14.425	14.754	14.987	15.281
84	14.751	13.299	12.473	12.675	13.263	13.647	14.010	14.313	14.692	15.037	15.290	15.634
85	9.360	9.610	9.907	10.282	10.561	10.811	10.999	11.140	11.234	11.266	11.395	11.600
86	**9.882**	**10.176**	**10.499**	**10.850**	**11.019**	**11.650**	**12.159**	**12.570**	**13.088**	**13.103**	**13.651**	**13.998**
87	12.163	13.141	14.311	14.636	14.351	15.360	16.239	16.724	17.743	17.652	18.620	18.742
88	10.346	11.533	12.738	12.918	12.351	13.446	14.104	14.495	14.875	13.713	15.002	15.656
89	14.838	15.077	15.945	16.608	17.096	17.779	19.050	19.688	22.011	24.643	24.595	23.433
90	6.777	6.732	6.659	6.937	7.233	7.573	7.822	8.111	8.313	8.364	8.627	8.984
91	7.175	7.343	7.678	7.972	8.266	8.661	9.029	9.296	9.611	9.834	10.205	10.465
92	3.811	3.886	3.975	4.063	4.183	4.374	4.338	4.396	4.479	4.764	5.246	6.056
93	6.272	5.945	5.366	5.645	5.713	5.969	6.115	6.591	6.801	6.581	6.722	7.072
94	7.675	7.579	7.379	7.676	8.316	8.714	8.950	9.092	9.120	9.200	9.415	9.909
95	**12.174**	**12.364**	**12.792**	**13.222**	**13.574**	**13.964**	**14.353**	**14.517**	**14.754**	**15.074**	**15.410**	**15.805**
96	43.682	43.401	44.001	44.871	46.202	47.419	48.281	48.484	48.539	49.470	49.749	49.195
97	52.871	52.288	52.945	53.968	55.573	56.872	57.770	57.967	57.962	57.979	58.058	57.236
98	9.677	9.874	10.085	10.311	10.612	11.092	11.472	11.580	11.687	13.412	13.847	13.956
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100	4.711	4.817	5.056	5.238	5.374	5.570	5.697	5.812	5.959	6.103	6.253	6.467
101	4.016	4.116	4.267	4.367	4.416	4.639	4.759	4.878	5.063	5.248	5.445	5.682
102	4.342	4.467	4.667	4.866	5.041	5.157	5.290	5.419	5.486	5.549	5.581	5.711
103	9.343	9.423	10.226	10.782	11.281	11.552	11.670	11.667	11.827	11.982	12.247	12.559
104	6.330	6.588	6.924	7.266	7.530	7.723	7.919	8.075	8.217	8.391	8.692	9.010
105	11.824	12.100	12.595	13.121	13.430	13.768	14.314	14.429	14.640	14.990	15.340	15.784
106	12.579	12.849	13.338	13.816	14.096	14.470	14.685	14.813	14.964	15.214	15.402	15.749

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
1	**16.697**	**16.764**	**17.100**	**17.620**	**18.035**	**18.305**	**18.606**	**18.801**	**19.023**	**19.245**	**19.527**	**19.810**
107	10.779	10.846	11.101	11.481	11.828	12.309	12.943	13.114	13.429	13.667	14.065	14.649
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	17.954	17.809	18.275	18.333	18.471	19.130	18.747	18.892	19.414	19.893	20.295	21.110
110	12.552	12.588	12.788	13.239	13.634	14.574	14.751	14.934	15.089	15.256	15.495	15.725
111	**42.206**	**43.294**	**45.300**	**47.346**	**48.578**	**49.452**	**46.284**	**46.749**	**47.411**	**48.173**	**48.393**	**49.743**
112	.....	.....	.....	.....	.....	10.811	11.082	11.288	11.501	11.778	12.063	12.413
113	.....	.....	.....	.....	.....	6.494	6.995	7.157	7.309	7.514	7.768	7.998

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1	**20.313**	**20.824**	**21.636**	**22.616**	**23.674**	**24.680**	**25.525**	**26.901**	**29.703**	**32.184**	**33.950**	**36.155**
2	**30.953**	**31.499**	**32.597**	**33.860**	**35.152**	**36.208**	**37.135**	**39.350**	**44.261**	**47.837**	**49.709**	**52.363**
3	**50.812**	**51.628**	**53.282**	**54.785**	**55.966**	**57.899**	**58.537**	**59.404**	**63.304**	**68.969**	**72.741**	**76.000**
4	**32.035**	**32.472**	**33.591**	**34.267**	**35.302**	**37.009**	**37.101**	**37.271**	**39.566**	**43.476**	**46.800**	**49.534**
5	35.457	35.784	36.796	37.371	38.436	40.036	39.744	39.756	41.974	45.749	48.596	51.158
6	15.451	15.857	16.868	17.406	17.736	19.476	20.516	21.979	23.818	27.418	31.535	33.929
7	45.169	46.275	47.973	49.526	51.892	53.801	54.159	52.756	56.320	61.423	65.780	70.215
8	**46.232**	**47.272**	**49.128**	**50.883**	**51.990**	**52.930**	**53.683**	**54.948**	**59.426**	**65.334**	**68.145**	**70.658**
9	43.596	45.002	46.723	48.585	49.607	50.456	51.139	52.640	57.222	61.750	63.814	66.228
10	60.981	61.030	62.318	63.687	65.259	66.601	66.947	67.015	70.444	78.236	82.579	85.581
11	34.117	35.114	37.844	39.420	40.661	41.861	43.716	46.206	52.197	61.091	64.970	67.696
12	56.254	56.143	58.441	60.766	60.420	59.871	59.799	59.930	63.669	69.577	72.048	73.562
13	**161.129**	**162.104**	**165.285**	**169.092**	**169.320**	**175.342**	**177.884**	**180.608**	**188.610**	**201.094**	**208.018**	**214.002**
14	613.069	604.374	601.586	600.969	601.104	604.812	609.456	608.755	619.686	637.558	645.176	646.735
15	65.535	67.965	71.677	74.762	75.008	74.820	73.420	74.353	77.082	81.850	84.485	86.505
16	29.465	30.204	31.264	32.539	31.400	35.285	36.554	38.196	42.514	46.888	49.220	52.305
17	17.359	17.844	18.766	19.961	21.079	22.340	23.435	24.122	24.585	29.176	32.990	36.068
18	45.090	46.055	48.616	52.167	54.558	57.108	58.017	58.384	61.024	65.644	67.231	68.033
19	**32.273**	**33.040**	**33.767**	**35.439**	**36.360**	**37.358**	**38.566**	**39.825**	**42.889**	**46.149**	**48.398**	**50.520**
20	45.925	46.482	47.924	50.639	51.513	52.494	53.785	55.686	58.894	63.122	65.193	66.124
21	24.180	24.831	25.363	26.123	27.224	28.390	29.078	29.778	31.445	34.020	36.096	38.282
22	9.401	9.707	10.208	10.776	11.185	11.933	12.719	13.134	13.591	14.482	15.459	16.439
23	38.243	39.790	39.760	41.722	42.785	43.606	45.399	46.948	53.298	57.666	61.540	67.074
24	30.553	31.562	33.182	35.020	36.321	38.797	41.366	42.685	44.219	47.101	50.276	53.324
25	**23.844**	**24.279**	**25.154**	**26.242**	**27.422**	**28.196**	**29.100**	**31.447**	**36.202**	**39.000**	**40.270**	**42.577**
26	**22.204**	**22.232**	**22.905**	**23.932**	**25.267**	**25.843**	**27.075**	**30.502**	**35.140**	**37.782**	**38.484**	**40.751**
27	21.146	21.149	21.805	22.838	24.188	24.721	25.990	29.687	34.694	37.352	38.029	40.522
28	30.939	31.387	32.096	32.797	33.904	34.874	35.458	36.044	38.273	40.895	41.771	42.422
29	31.447	30.219	31.931	35.031	35.500	36.018	42.379	55.551	49.559	50.654	52.031	52.232
30	**56.951**	**59.298**	**62.649**	**66.038**	**68.494**	**70.930**	**72.217**	**74.614**	**80.150**	**83.744**	**86.430**	**90.119**
31	60.063	62.439	66.011	69.475	71.842	74.438	75.627	78.004	84.046	87.868	90.570	94.392
32	68.941	71.879	76.022	79.506	81.930	85.331	86.810	89.262	95.349	99.015	101.621	105.288
33	52.029	53.897	56.981	60.647	63.124	64.918	65.763	68.152	73.489	76.690	79.409	83.089
34	32.360	32.713	34.111	35.204	35.874	36.650	37.698	38.952	49.183	59.088	62.277	68.295
35	45.005	47.169	49.700	52.714	55.350	57.186	58.750	61.132	64.820	67.546	70.122	73.269
36	**12.003**	**12.394**	**12.621**	**13.008**	**13.190**	**13.406**	**13.565**	**14.980**	**20.832**	**22.295**	**23.362**	**25.030**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1	**20.313**	**20.824**	**21.636**	**22.616**	**23.674**	**24.680**	**25.525**	**26.901**	**29.703**	**32.184**	**33.950**	**36.155**
37	13.256	13.694	13.896	14.354	14.482	14.588	14.777	16.190	21.871	23.339	24.331	25.740
38	6.947	7.163	7.391	7.547	7.838	8.336	8.388	9.614	15.278	16.578	17.782	20.121
39	**20.710**	**21.217**	**22.030**	**22.845**	**23.911**	**24.827**	**25.445**	**26.139**	**28.711**	**32.008**	**33.664**	**35.615**
40	17.693	17.565	17.545	17.741	18.104	18.335	18.349	18.369	18.940	20.405	21.603	22.965
41	45.216	46.222	48.352	50.644	52.533	54.560	55.939	56.935	59.792	63.710	65.813	67.535
42	26.741	27.445	28.237	28.862	29.983	31.101	31.624	32.378	37.882	45.503	48.722	52.496
43	27.450	27.929	28.778	30.076	30.829	31.832	32.674	33.535	37.234	41.925	44.334	46.822
44	8.545	8.865	9.423	9.926	10.756	11.211	11.824	12.151	12.743	13.651	14.230	14.915
45	18.742	19.476	20.524	21.345	22.682	24.111	24.549	25.399	29.550	33.074	34.537	36.489
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**15.277**	**15.786**	**16.468**	**17.326**	**18.287**	**19.285**	**20.103**	**21.078**	**22.868**	**24.836**	**26.558**	**28.560**
48	**14.643**	**15.131**	**15.788**	**16.604**	**17.533**	**18.489**	**19.275**	**20.199**	**21.873**	**23.751**	**25.411**	**27.332**
49	**16.934**	**17.225**	**17.619**	**18.184**	**18.975**	**19.947**	**20.703**	**21.632**	**22.829**	**24.624**	**26.406**	**28.746**
50	17.764	18.105	18.549	19.162	19.981	20.909	21.663	22.584	23.430	24.947	26.579	28.819
51	17.556	17.859	18.299	18.882	19.675	20.571	21.290	22.225	23.047	24.589	26.232	28.460
52	17.690	18.016	18.456	19.039	19.832	20.746	21.474	22.401	23.246	24.792	26.442	28.697
53	23.828	25.000	25.665	27.409	29.339	31.124	33.116	33.728	34.885	35.018	35.871	37.681
54	17.615	17.888	18.184	18.924	19.655	20.509	21.194	22.061	23.179	24.722	26.289	28.408
55	13.724	13.823	14.025	14.407	15.091	16.223	16.986	17.944	20.518	23.419	25.796	28.528
56	9.640	9.863	10.334	11.032	11.907	13.173	13.661	14.396	15.271	16.753	18.629	20.646
57	15.076	15.142	15.273	15.573	16.214	17.326	18.177	19.214	22.327	25.685	28.242	31.221
58	19.721	19.862	20.011	20.449	21.111	22.507	23.607	25.071	29.619	33.431	35.630	37.995
59	8.421	8.421	8.510	8.646	9.132	9.796	10.282	10.774	12.101	14.495	16.978	20.158
60	**9.016**	**9.590**	**10.195**	**10.914**	**11.738**	**12.343**	**12.867**	**13.475**	**14.755**	**16.414**	**17.996**	**19.496**
61	11.283	12.008	12.677	13.589	14.539	15.503	16.024	16.546	18.011	20.145	22.220	24.187
62	10.843	11.579	12.222	13.122	14.080	15.027	15.507	15.994	17.483	19.610	21.839	23.855
63	9.740	10.229	10.784	11.551	12.196	12.982	13.508	13.950	14.987	16.552	17.637	18.940
64	13.242	14.133	14.958	15.957	17.184	18.305	18.872	19.564	21.338	24.009	26.706	29.189
65	7.527	8.002	8.566	9.158	9.897	10.284	10.794	11.431	12.575	13.932	15.205	16.415
66	7.073	7.519	8.043	8.607	9.298	9.652	10.138	10.746	11.796	13.095	14.348	15.535
67	10.761	11.442	12.289	13.081	14.159	14.783	15.467	16.313	18.118	19.884	21.298	22.660
68	**17.608**	**18.266**	**19.089**	**20.265**	**21.831**	**23.364**	**24.254**	**25.326**	**27.497**	**30.537**	**32.815**	**35.092**
69	16.566	17.206	18.021	19.065	20.340	21.668	22.533	23.736	26.004	29.153	31.188	33.443
70	14.924	15.568	16.392	17.447	18.741	20.092	20.974	22.145	24.378	27.493	29.488	31.706
71	26.406	26.591	26.793	27.114	27.513	27.938	28.231	29.225	30.859	33.022	34.596	36.277

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1	**20.313**	**20.824**	**21.636**	**22.616**	**23.674**	**24.680**	**25.525**	**26.901**	**29.703**	**32.184**	**33.950**	**36.155**
72	20.878	21.609	22.489	24.024	26.336	28.428	29.415	30.238	32.330	35.322	38.260	40.717
73	13.263	13.975	14.717	15.636	17.383	18.835	19.662	19.966	21.072	23.101	24.989	26.731
74	27.300	27.335	27.917	30.046	32.348	34.755	35.591	37.060	40.121	43.693	47.385	50.218
75	33.260	34.287	35.861	38.274	41.373	43.574	45.519	47.518	51.444	56.240	60.579	65.029
76	**19.773**	**20.465**	**21.560**	**22.476**	**23.514**	**24.548**	**25.177**	**26.071**	**27.879**	**29.934**	**31.416**	**32.919**
77	17.019	17.777	18.862	19.957	21.344	22.435	23.164	24.069	25.867	27.910	29.579	31.277
78	26.343	26.819	27.893	28.042	27.985	28.644	28.851	29.273	30.333	31.957	32.794	33.466
79	18.332	18.838	19.642	20.706	21.921	22.853	23.602	25.088	27.834	30.379	32.155	34.231
80	19.249	19.980	21.306	22.395	23.280	24.972	25.769	26.694	28.799	31.055	32.629	34.379
81	**15.396**	**16.250**	**17.098**	**18.121**	**19.461**	**20.499**	**21.257**	**22.710**	**25.337**	**27.619**	**29.447**	**31.579**
82	15.895	16.789	17.665	18.715	20.096	21.183	21.989	23.543	26.361	28.773	30.651	32.848
83	15.888	16.788	17.665	18.712	20.092	21.182	21.986	23.531	26.339	28.746	30.620	32.810
84	16.363	17.194	18.084	19.197	20.623	21.683	22.553	24.331	27.440	29.993	32.022	34.407
85	11.803	12.336	12.973	13.826	14.868	15.512	15.883	16.552	17.695	18.996	20.450	22.104
86	**14.842**	**15.183**	**16.307**	**17.765**	**18.677**	**19.797**	**21.010**	**21.506**	**23.229**	**24.948**	**25.955**	**27.949**
87	20.176	20.504	21.795	24.756	25.863	26.534	27.828	28.466	32.509	35.815	35.850	36.968
88	16.968	17.803	17.869	21.319	22.728	22.367	23.250	24.431	29.007	31.606	31.061	32.093
89	24.982	24.293	27.870	29.344	29.375	33.247	35.574	33.955	34.147	39.246	42.068	43.070
90	9.403	9.678	10.495	10.988	11.624	12.724	13.664	13.996	14.289	14.901	16.252	18.395
91	10.840	11.218	11.867	12.456	13.204	13.786	14.506	15.299	16.418	17.604	18.986	20.732
92	6.795	7.571	8.099	8.559	9.041	10.008	10.409	10.388	9.373	9.525	11.256	12.610
93	7.456	7.535	9.030	9.274	9.508	11.015	12.626	12.673	12.476	12.524	13.040	16.206
94	10.442	10.764	11.015	11.724	12.794	14.171	14.560	14.671	14.659	15.347	17.935	19.138
95	**16.262**	**16.782**	**17.524**	**18.373**	**19.258**	**20.395**	**21.439**	**22.699**	**25.154**	**26.957**	**28.642**	**30.113**
96	48.309	49.037	49.879	50.648	51.210	54.490	57.596	58.985	62.248	64.244	68.021	68.828
97	55.976	56.716	56.719	57.467	58.137	60.991	64.425	66.073	68.864	71.089	73.617	74.454
98	14.068	14.448	16.385	16.875	16.997	19.868	21.094	21.389	24.725	25.471	32.140	32.651
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
100	6.757	7.037	7.359	7.809	8.349	8.794	9.248	9.950	11.256	12.244	13.137	13.992
101	5.968	6.272	6.652	7.100	7.598	8.073	8.520	8.987	9.762	10.486	11.209	11.947
102	5.932	6.093	6.254	6.642	7.217	7.572	7.959	9.054	10.911	12.151	13.216	14.003
103	13.042	13.501	13.920	14.497	15.069	15.487	16.072	16.895	19.885	21.649	22.977	24.613
104	9.242	9.620	10.001	10.658	11.497	12.251	13.107	14.073	15.344	16.462	17.473	18.594
105	16.570	17.394	18.226	19.190	20.149	20.794	21.174	22.228	24.478	26.487	28.232	30.085
106	16.151	16.560	17.250	18.312	18.999	19.974	20.913	22.085	25.191	27.449	29.042	30.919

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1	**20.313**	**20.824**	**21.636**	**22.616**	**23.674**	**24.680**	**25.525**	**26.901**	**29.703**	**32.184**	**33.950**	**36.155**
107	15.378	15.953	17.301	18.510	19.926	21.083	22.065	23.419	25.701	27.780	30.719	32.928
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	21.887	21.729	22.685	23.192	23.536	25.749	27.344	29.917	36.212	39.825	40.612	43.067
110	16.185	16.656	17.344	18.265	19.372	20.113	20.800	21.977	23.882	25.724	27.632	29.528
111	**51.569**	**53.242**	**55.280**	**58.721**	**61.268**	**64.628**	**67.272**	**71.595**	**81.930**	**89.516**	**94.258**	**100.718**
112	12.845	13.433	14.140	15.062	16.044	16.815	17.608	18.735	20.988	23.099	24.893	26.751
113	8.268	8.697	9.211	9.823	10.552	11.030	11.577	12.317	13.686	15.104	16.411	17.671

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	**38.687**	**42.118**	**46.641**	**50.810**	**53.615**	**55.923**	**58.038**	**59.938**	**61.399**	**63.589**	**66.121**	**68.994**
2	**55.576**	**60.832**	**67.644**	**72.669**	**74.650**	**75.997**	**77.435**	**78.677**	**78.309**	**80.827**	**82.958**	**86.150**
3	**80.255**	**85.574**	**93.000**	**99.219**	**103.089**	**105.177**	**106.732**	**107.862**	**109.048**	**112.185**	**114.036**	**116.114**
4	**52.968**	**56.961**	**61.183**	**65.916**	**69.041**	**71.187**	**73.222**	**74.918**	**76.984**	**80.506**	**81.771**	**84.187**
5	55.019	59.269	63.909	67.702	70.349	72.153	74.253	76.742	80.066	82.432	83.751	85.644
6	36.136	37.547	37.763	45.315	50.555	57.565	63.485	63.629	62.766	71.792	72.851	77.224
7	73.483	80.648	89.637	94.182	96.482	93.747	90.135	90.088	89.819	90.544	91.953	93.906
8	**74.233**	**78.864**	**85.271**	**91.573**	**96.293**	**98.536**	**99.730**	**100.824**	**101.886**	**103.496**	**104.972**	**105.285**
9	69.451	73.716	80.343	86.239	90.317	92.340	94.253	96.373	97.882	99.670	101.832	102.468
10	89.952	94.852	99.583	105.356	111.820	115.076	115.299	112.761	112.208	113.055	113.305	113.262
11	72.585	78.563	86.734	95.417	99.412	101.277	101.484	101.905	104.656	107.219	108.031	109.662
12	75.156	79.293	84.731	90.622	97.366	99.684	99.769	102.988	101.228	101.485	101.565	97.985
13	**221.680**	**231.548**	**244.415**	**255.375**	**261.271**	**258.144**	**254.490**	**250.017**	**242.083**	**239.024**	**237.492**	**236.860**
14	656.208	672.378	688.035	700.619	695.621	662.394	633.069	599.574	561.317	542.541	521.270	506.697
15	88.766	92.622	98.636	104.237	107.224	108.464	108.484	106.854	105.905	107.518	111.327	113.597
16	55.520	59.286	64.879	68.961	71.700	72.608	75.118	77.255	77.230	77.612	80.088	82.500
17	39.405	42.556	46.752	51.654	57.510	61.721	62.974	67.520	70.586	72.069	74.354	77.067
18	70.993	74.606	80.345	85.960	90.444	91.378	91.754	91.390	91.735	93.187	97.570	100.881
19	**53.325**	**57.724**	**69.530**	**73.356**	**74.063**	**76.452**	**78.084**	**78.936**	**80.801**	**86.302**	**91.937**	**96.212**
20	69.637	75.981	94.959	98.815	96.499	98.059	98.726	97.735	98.649	106.050	111.796	116.004
21	40.509	42.793	46.491	50.138	53.521	56.141	58.283	60.614	63.001	66.068	68.888	71.713
22	17.743	18.875	20.456	22.953	25.926	28.562	30.878	33.483	36.225	38.935	41.663	44.351
23	70.632	76.910	96.298	100.240	97.926	99.530	100.164	99.182	100.070	107.139	121.899	130.623
24	57.989	61.563	66.671	74.709	84.312	92.764	100.309	108.739	117.656	126.565	135.480	144.207
25	**45.299**	**50.181**	**56.338**	**60.689**	**62.066**	**63.131**	**64.443**	**65.650**	**64.811**	**67.015**	**69.146**	**72.576**
26	**44.650**	**49.035**	**53.158**	**56.946**	**58.444**	**59.115**	**60.891**	**61.554**	**63.003**	**64.990**	**66.929**	**70.458**
27	44.592	49.065	53.236	57.090	58.466	58.927	60.794	61.368	62.767	64.867	66.862	70.602
28	44.702	48.203	52.223	55.693	57.992	60.167	61.311	62.693	64.489	65.639	67.190	69.248
29	66.860	80.285	77.229	76.814	79.116	74.956	78.029	73.086	74.162	80.998	82.353	86.744
30	**91.822**	**93.619**	**97.052**	**100.257**	**101.726**	**103.118**	**103.653**	**105.877**	**105.441**	**108.479**	**111.969**	**113.607**
31	95.915	96.769	99.544	102.464	103.810	105.491	106.002	108.592	108.194	111.455	114.801	116.057
32	106.886	107.252	109.021	110.505	110.568	111.715	111.656	114.307	112.907	117.111	120.375	120.592
33	84.359	85.724	89.289	93.494	96.316	98.316	99.525	101.779	102.218	104.513	107.941	110.654
34	70.928	72.343	78.262	85.087	88.180	92.569	93.945	98.106	102.369	102.367	106.080	108.206
35	75.579	80.711	86.483	90.689	92.608	92.858	93.483	94.212	93.621	95.738	99.789	102.972
36	**26.182**	**35.267**	**49.040**	**55.313**	**52.744**	**50.706**	**50.181**	**50.289**	**39.481**	**40.940**	**41.245**	**44.901**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	**38.687**	**42.118**	**46.641**	**50.810**	**53.615**	**55.923**	**58.038**	**59.938**	**61.399**	**63.589**	**66.121**	**68.994**
37	26.858	35.993	49.955	55.584	52.772	51.047	50.283	50.689	39.810	41.340	41.691	45.539
38	21.275	29.331	41.187	50.389	49.415	45.558	46.572	44.756	35.044	35.954	35.938	38.077
39	**37.552**	**40.007**	**43.661**	**47.362**	**51.028**	**54.542**	**56.564**	**58.752**	**61.092**	**63.552**	**66.397**	**70.065**
40	24.610	26.286	28.609	31.749	35.089	38.183	41.027	43.942	46.712	49.440	52.331	55.866
41	70.274	74.664	82.188	89.041	93.330	94.908	96.137	97.622	98.815	101.642	105.334	109.256
42	55.500	59.398	64.956	70.244	74.780	77.583	79.254	81.566	82.947	85.135	87.198	90.509
43	49.151	52.321	56.657	61.818	66.688	70.364	72.563	74.664	76.897	78.387	80.846	83.883
44	15.739	16.651	17.920	19.326	21.450	25.600	27.239	28.801	30.730	32.856	35.780	40.299
45	37.930	40.249	44.122	48.115	51.625	54.508	56.248	58.167	59.769	61.447	63.451	65.917
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**30.779**	**33.353**	**36.805**	**40.558**	**43.712**	**46.433**	**48.850**	**51.053**	**53.378**	**55.413**	**58.127**	**60.844**
48	**29.467**	**31.916**	**35.229**	**38.882**	**42.086**	**44.908**	**47.392**	**49.635**	**52.025**	**54.106**	**56.862**	**59.738**
49	**30.775**	**33.263**	**36.746**	**40.800**	**44.563**	**47.446**	**49.860**	**52.486**	**54.983**	**56.960**	**59.215**	**61.601**
50	30.796	33.173	36.220	39.909	43.193	45.790	48.175	51.051	54.074	56.532	59.069	61.522
51	30.408	32.773	35.816	39.530	42.815	45.475	48.052	51.218	54.415	56.863	59.180	61.539
52	30.671	33.058	36.129	39.855	43.243	45.862	48.216	51.051	54.085	56.586	59.175	61.638
53	40.083	42.187	44.134	45.743	44.312	44.723	45.157	44.586	43.549	43.964	47.950	51.618
54	30.466	32.828	35.870	39.166	42.324	44.959	47.514	50.615	53.795	56.250	58.542	60.898
55	30.765	33.695	38.931	44.485	50.239	54.310	56.842	58.398	58.614	58.480	59.510	61.593
56	23.044	24.128	25.789	28.905	32.380	35.114	37.480	39.788	42.097	44.589	47.232	50.267
57	33.465	36.948	43.267	49.597	56.087	60.601	63.216	64.557	64.102	63.092	63.588	65.359
58	40.372	43.449	50.330	57.864	63.600	65.682	69.878	72.383	73.326	73.108	74.108	76.186
59	21.983	25.500	30.488	34.748	41.490	48.605	48.924	48.610	46.257	44.163	43.888	45.091
60	**21.142**	**23.202**	**26.012**	**29.188**	**32.474**	**35.444**	**38.097**	**40.408**	**42.810**	**45.564**	**49.116**	**53.435**
61	26.083	28.330	31.439	34.697	37.659	40.395	43.072	45.724	48.713	51.760	55.251	58.926
62	25.810	28.205	31.189	34.599	37.849	40.812	43.648	46.184	49.541	53.189	56.997	61.177
63	20.255	21.956	24.571	26.915	28.999	30.942	33.453	35.568	37.541	40.089	42.778	45.399
64	31.439	33.582	37.368	40.877	43.602	46.256	48.331	51.698	54.492	56.189	59.407	62.581
65	17.872	19.759	22.310	25.329	28.665	31.661	34.224	36.276	38.271	40.787	44.323	49.022
66	16.910	18.728	21.252	24.277	27.717	30.841	33.511	35.651	37.775	40.411	44.174	49.245
67	24.700	27.073	29.794	32.741	35.236	37.282	39.145	40.676	41.923	43.768	46.048	48.821
68	**37.414**	**40.741**	**47.289**	**53.041**	**55.979**	**58.104**	**60.397**	**61.589**	**62.206**	**64.842**	**67.873**	**70.857**
69	36.037	39.536	43.607	47.600	51.142	53.366	55.206	56.793	58.929	61.361	63.756	66.347
70	34.280	37.595	41.443	45.217	48.526	50.564	52.168	53.535	55.155	57.191	59.482	61.861
71	37.993	41.825	46.345	50.766	55.009	58.034	61.166	63.915	69.216	73.890	76.324	79.721

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	**38.687**	**42.118**	**46.641**	**50.810**	**53.615**	**55.923**	**58.038**	**59.938**	**61.399**	**63.589**	**66.121**	**68.994**
72	42.572	45.707	58.199	68.484	69.985	71.929	75.463	75.554	71.880	75.108	79.963	84.090
73	28.163	30.262	35.030	41.047	45.151	47.354	50.233	52.130	55.795	57.368	59.606	61.413
74	52.200	56.014	75.778	89.413	87.360	88.693	92.489	90.802	81.016	85.364	92.040	97.771
75	69.949	73.495	78.644	82.807	86.253	89.251	91.990	95.343	100.206	102.748	104.245	108.251
76	**34.887**	**37.191**	**40.004**	**42.553**	**44.873**	**46.821**	**48.845**	**50.953**	**52.922**	**54.974**	**57.083**	**59.921**
77	33.386	35.536	37.944	40.094	42.344	44.474	46.530	48.677	51.016	53.184	55.144	58.136
78	34.871	36.769	39.393	41.694	43.728	45.236	47.097	49.273	51.195	53.253	55.536	58.309
79	36.572	39.998	44.345	48.468	51.304	53.414	55.597	57.475	58.531	60.473	62.709	65.378
80	36.273	38.463	41.251	43.831	46.228	48.055	49.937	51.849	53.751	55.244	57.028	59.520
81	**34.340**	**38.047**	**41.732**	**45.460**	**48.059**	**50.135**	**52.396**	**54.648**	**56.888**	**59.203**	**61.748**	**64.544**
82	35.618	39.378	43.067	46.830	49.288	51.380	53.541	55.683	57.959	60.163	62.637	65.464
83	35.573	39.320	42.997	46.752	49.207	51.298	53.458	55.602	57.882	60.083	62.558	65.382
84	37.373	41.487	45.538	49.540	52.108	54.289	56.500	58.638	60.834	63.153	65.622	68.560
85	24.840	28.189	31.915	35.429	39.202	41.187	44.272	47.372	49.359	52.495	55.575	58.164
86	**31.638**	**33.361**	**35.942**	**38.658**	**40.890**	**44.831**	**47.666**	**49.700**	**52.479**	**53.873**	**57.147**	**59.147**
87	43.013	46.394	51.058	54.301	55.182	59.793	61.272	63.673	69.510	72.838	75.442	73.960
88	37.477	40.592	43.659	45.252	44.326	49.014	50.640	52.511	58.021	62.381	64.979	61.876
89	49.437	52.499	62.168	70.813	78.405	80.961	81.258	84.898	90.088	88.975	91.002	94.835
90	20.185	20.734	21.786	23.740	26.269	29.283	32.805	34.367	34.428	34.089	37.671	42.208
91	22.481	24.132	26.128	27.815	29.499	31.731	33.725	36.872	40.065	42.964	45.543	47.556
92	12.888	13.762	15.421	16.942	18.841	20.601	21.516	22.815	25.143	26.554	28.276	29.785
93	18.734	17.441	17.377	20.189	24.697	29.186	35.003	34.729	30.120	25.808	30.425	37.885
94	20.021	21.831	23.159	24.078	24.733	26.819	29.480	31.632	34.669	36.693	39.857	43.088
95	**31.693**	**33.994**	**37.082**	**40.878**	**44.060**	**46.547**	**48.916**	**50.698**	**53.357**	**54.646**	**56.933**	**59.081**
96	70.130	70.344	71.420	78.846	87.032	91.891	97.828	101.327	104.403	102.209	102.214	102.456
97	75.291	75.034	76.301	83.573	92.074	97.879	105.009	108.095	111.573	108.883	107.589	107.414
98	35.338	37.295	37.412	43.860	49.109	49.232	49.370	53.651	54.521	54.695	59.882	61.896
99	.....	.....	.....	.....	.....	.....	.....	.....	.....	158.155	160.259	151.609
100	14.729	16.019	17.802	19.889	22.132	24.026	26.101	28.072	30.008	32.126	34.520	36.977
101	12.605	13.613	14.909	16.756	19.013	20.992	23.141	25.248	27.287	29.345	31.576	34.075
102	14.466	15.755	17.663	19.672	21.855	23.673	25.697	27.665	29.726	32.131	34.853	37.546
103	26.478	29.321	33.580	36.994	38.562	39.461	40.659	41.448	42.278	43.924	46.393	48.250
104	19.874	21.630	24.545	27.655	30.891	34.557	37.371	39.554	41.960	44.870	46.748	49.239
105	32.719	36.219	40.302	44.216	47.123	49.222	51.636	53.929	55.927	57.978	60.437	63.372
106	32.988	36.218	40.907	44.765	46.753	47.968	49.560	50.678	52.076	53.967	57.013	59.742

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1	**38.687**	**42.118**	**46.641**	**50.810**	**53.615**	**55.923**	**58.038**	**59.938**	**61.399**	**63.589**	**66.121**	**68.994**
107	35.385	38.742	42.013	45.713	48.640	50.124	51.883	53.819	55.272	56.472	58.314	59.810
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	44.893	49.986	56.259	59.667	57.246	55.277	53.196	51.593	56.778	55.578	58.979	59.604
110	32.095	35.188	39.492	43.651	47.170	49.553	52.347	54.859	56.683	59.461	61.808	63.894
111	**107.370**	**117.927**	**129.131**	**135.990**	**129.701**	**120.696**	**115.921**	**113.630**	**110.239**	**108.437**	**107.544**	**101.090**
112	28.785	31.674	35.460	39.333	42.394	44.678	46.836	48.715	50.416	52.626	55.727	58.789
113	19.074	21.002	23.686	26.724	29.952	32.815	35.354	37.465	39.567	42.072	45.462	49.701

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	**72.147**	**74.755**	**76.954**	**78.643**	**80.265**	**82.041**	**83.826**	**85.395**	**86.207**	**87.596**	**89.777**	**91.488**
2	**89.678**	**91.870**	**92.978**	**93.786**	**94.740**	**95.625**	**96.676**	**96.563**	**95.106**	**95.603**	**97.520**	**97.429**
3	**117.268**	**118.986**	**119.808**	**120.987**	**123.356**	**124.255**	**123.001**	**120.314**	**116.909**	**113.741**	**111.693**	**109.479**
4	**84.458**	**86.834**	**88.473**	**91.957**	**96.226**	**100.038**	**102.043**	**102.428**	**101.314**	**101.618**	**101.994**	**102.394**
5	87.484	90.896	93.243	95.952	99.462	101.936	103.924	104.610	104.080	104.012	103.888	103.323
6	73.018	73.765	74.410	81.864	90.099	98.350	101.446	101.722	99.476	100.733	102.036	103.562
7	94.234	95.081	95.704	94.143	93.610	93.935	93.779	93.277	92.494	92.046	92.371	94.641
8	**106.350**	**106.956**	**108.223**	**108.797**	**110.477**	**110.305**	**110.618**	**110.454**	**110.362**	**108.927**	**108.138**	**106.285**
9	103.851	104.466	106.351	107.432	109.223	109.813	110.497	110.325	110.326	109.558	108.894	106.870
10	112.549	111.359	110.631	110.924	112.313	111.442	111.262	110.732	109.327	106.901	105.821	105.080
11	111.822	114.405	116.682	116.047	117.588	115.275	113.928	113.193	115.681	113.270	111.920	108.849
12	98.833	99.918	99.793	99.806	101.576	101.602	103.295	104.777	102.185	100.057	100.023	99.476
13	**234.938**	**231.956**	**224.830**	**216.764**	**212.248**	**203.327**	**188.915**	**173.104**	**158.493**	**144.658**	**135.567**	**126.318**
14	484.177	460.918	429.457	399.666	378.600	347.508	302.538	259.145	221.208	190.415	170.651	150.441
15	117.720	122.279	123.042	121.820	123.736	122.880	121.628	120.624	118.308	112.343	108.289	105.984
16	84.524	86.238	88.052	88.982	91.061	93.608	94.397	93.745	93.933	96.106	97.905	99.298
17	81.388	84.145	86.211	88.429	90.129	91.672	95.038	96.150	98.803	97.053	96.937	98.055
18	101.944	102.062	103.325	104.215	105.089	103.489	104.554	103.430	102.982	101.594	101.456	102.416
19	**102.276**	**106.062**	**108.862**	**109.700**	**111.452**	**113.307**	**112.631**	**111.051**	**109.020**	**106.275**	**104.869**	**105.203**
20	122.933	126.769	128.288	127.354	128.162	126.729	122.188	117.435	113.120	110.430	107.323	107.408
21	74.912	77.935	81.043	83.338	84.940	87.507	88.887	90.146	91.645	92.523	94.473	96.314
22	47.963	50.451	53.228	55.087	57.078	59.265	62.632	65.680	68.767	71.565	76.548	80.936
23	142.856	148.288	152.196	151.963	155.783	166.532	166.931	159.875	149.053	132.155	125.026	123.268
24	155.903	164.016	173.034	179.109	185.579	192.749	203.667	213.545	207.334	183.743	165.966	148.960
25	**76.736**	**78.977**	**80.124**	**80.776**	**81.206**	**82.055**	**83.913**	**84.789**	**84.160**	**86.259**	**90.006**	**90.952**
26	**73.900**	**76.220**	**76.805**	**77.880**	**79.184**	**80.900**	**83.368**	**84.956**	**86.024**	**87.433**	**89.486**	**92.116**
27	74.119	75.582	75.958	77.157	78.656	80.577	83.107	84.733	85.903	87.253	89.210	91.944
28	72.136	80.551	82.767	82.851	82.749	82.969	85.003	86.298	86.749	88.581	91.244	93.197
29	93.556	89.791	86.328	88.605	81.795	81.638	82.265	87.233	77.667	74.289	78.381	83.590
30	**117.311**	**119.543**	**120.433**	**119.790**	**117.774**	**115.023**	**113.638**	**113.673**	**111.604**	**110.127**	**108.816**	**106.659**
31	120.062	122.305	122.846	122.005	119.755	116.589	115.044	115.244	113.012	111.834	110.557	108.034
32	125.421	127.155	127.579	126.639	123.959	119.384	116.458	116.319	113.290	111.275	109.707	107.652
33	113.184	116.213	116.941	116.519	114.768	113.317	113.380	114.304	113.284	112.893	111.733	108.277
34	113.931	115.972	116.426	113.504	112.224	111.423	112.857	111.013	108.155	110.490	111.747	110.613
35	105.436	107.612	109.956	110.155	109.141	108.163	107.463	106.799	105.424	102.702	101.251	100.628
36	**51.419**	**50.557**	**50.173**	**49.680**	**49.802**	**50.470**	**53.908**	**53.906**	**46.996**	**50.883**	**65.768**	**63.480**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	**72.147**	**74.755**	**76.954**	**78.643**	**80.265**	**82.041**	**83.826**	**85.395**	**86.207**	**87.596**	**89.777**	**91.488**
37	51.843	51.162	50.963	50.446	50.685	51.491	54.645	54.634	47.555	51.788	66.170	63.776
38	45.856	43.658	41.881	41.592	40.836	40.455	45.851	45.926	40.699	41.395	60.692	59.506
39	**73.610**	**77.532**	**80.450**	**81.807**	**82.380**	**83.839**	**85.425**	**86.318**	**87.942**	**91.377**	**93.380**	**95.548**
40	60.139	64.768	68.466	70.499	72.153	72.691	74.395	75.594	77.485	80.830	83.871	87.838
41	112.014	114.459	115.883	115.737	116.611	117.100	118.255	117.620	115.326	111.486	109.573	108.720
42	92.804	94.741	95.004	94.936	95.061	96.772	97.823	97.828	98.278	99.166	101.556	103.566
43	86.939	89.800	91.839	93.210	94.530	95.234	95.526	95.740	97.180	98.577	99.878	100.847
44	44.390	49.499	53.681	55.606	53.370	54.689	56.353	58.850	63.968	79.644	85.268	88.387
45	68.219	72.517	76.286	78.614	81.156	85.593	89.412	91.348	93.405	94.447	94.870	96.041
46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
47	**63.812**	**66.586**	**69.240**	**71.299**	**73.205**	**75.370**	**77.479**	**79.817**	**81.695**	**83.515**	**85.824**	**88.428**
48	**62.930**	**65.930**	**68.869**	**71.116**	**73.087**	**75.323**	**77.457**	**79.765**	**81.529**	**83.306**	**85.523**	**88.064**
49	**64.277**	**66.410**	**68.263**	**70.236**	**72.049**	**73.998**	**76.187**	**78.263**	**80.108**	**82.014**	**84.783**	**88.718**
50	64.414	66.449	68.268	70.129	72.101	74.328	76.580	78.728	81.221	83.472	86.060	89.456
51	64.216	66.589	68.388	70.065	71.745	73.453	75.352	77.479	79.835	82.171	85.065	88.746
52	64.595	66.474	68.264	70.090	72.063	74.448	76.811	79.049	81.610	83.834	86.328	89.639
53	55.163	58.912	62.766	70.504	78.489	81.732	84.399	80.904	81.601	83.846	86.338	89.621
54	63.511	65.865	67.631	69.304	70.955	72.714	74.634	76.808	79.245	81.660	84.625	88.365
55	63.311	65.867	67.865	70.337	71.425	72.075	73.961	75.687	74.445	74.675	78.323	84.949
56	53.815	57.963	62.096	65.524	68.748	70.966	73.504	75.318	77.756	79.478	81.429	83.779
57	66.461	68.489	69.800	71.970	72.364	72.490	74.156	75.852	73.323	73.028	77.275	85.413
58	77.958	80.865	82.435	84.051	84.083	85.979	87.405	87.872	84.474	83.813	85.169	91.206
59	45.131	45.697	46.540	49.392	50.316	47.665	49.604	53.051	52.060	52.435	61.879	73.711
60	**57.995**	**62.476**	**66.868**	**70.442**	**73.304**	**75.978**	**77.766**	**79.324**	**80.820**	**82.594**	**84.919**	**87.769**
61	62.801	66.475	70.215	73.535	76.930	79.565	80.819	82.960	85.015	86.969	89.065	91.855
62	65.578	69.442	73.804	77.913	81.817	85.035	85.631	86.782	88.641	90.609	92.181	94.804
63	48.361	51.927	55.369	58.222	60.953	63.890	66.839	69.935	72.911	76.319	79.798	83.032
64	65.871	69.199	71.939	74.162	77.083	78.680	80.048	83.139	85.026	86.250	88.449	91.266
65	54.025	59.068	63.932	67.687	70.119	72.812	75.027	76.107	77.149	78.771	81.278	84.170
66	54.613	60.149	65.627	69.776	72.308	74.867	76.674	77.310	77.879	79.227	81.327	83.737
67	52.075	54.840	56.913	58.921	60.930	64.209	68.127	71.051	74.071	76.868	81.172	86.276
68	**73.565**	**75.584**	**77.732**	**80.436**	**81.417**	**83.214**	**84.263**	**86.130**	**87.648**	**88.956**	**91.625**	**92.643**
69	68.905	71.577	73.790	76.041	78.296	80.285	81.843	82.991	84.574	86.318	88.732	91.656
70	64.262	66.968	69.417	71.442	73.334	75.013	76.938	78.919	80.844	83.066	85.705	88.685
71	82.672	84.504	85.161	88.164	91.659	94.625	95.010	93.933	94.676	95.268	97.188	100.015

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	**72.147**	**74.755**	**76.954**	**78.643**	**80.265**	**82.041**	**83.826**	**85.395**	**86.207**	**87.596**	**89.777**	**91.488**
72	87.241	87.511	89.516	93.528	90.800	92.032	91.529	95.633	96.941	96.921	100.351	95.723
73	64.382	67.485	70.226	71.109	71.761	72.565	77.961	79.211	79.863	79.862	81.862	84.416
74	100.910	98.856	100.133	106.512	101.125	102.578	97.795	103.714	105.227	105.359	110.346	101.631
75	113.109	117.718	121.444	124.831	127.591	131.494	134.908	138.513	145.453	140.867	125.979	114.001
76	**63.192**	**66.478**	**68.541**	**70.736**	**72.246**	**73.839**	**76.299**	**78.766**	**80.716**	**83.311**	**86.536**	**89.372**
77	61.202	64.296	66.019	67.810	70.105	71.747	74.283	76.634	78.540	82.167	86.016	89.303
78	61.936	66.036	68.798	71.945	72.190	73.454	76.371	80.064	82.835	84.677	87.073	89.335
79	68.669	71.186	73.052	74.943	76.554	78.423	80.542	82.258	83.479	85.331	88.179	90.659
80	62.230	64.898	66.455	67.914	69.633	71.291	72.944	74.418	76.166	78.711	82.817	86.488
81	**67.499**	**70.194**	**71.684**	**73.090**	**74.373**	**76.128**	**78.179**	**80.497**	**82.654**	**84.790**	**87.160**	**89.644**
82	68.469	71.112	72.553	73.873	75.070	76.719	78.605	80.785	82.778	84.833	86.973	89.647
83	68.384	71.036	72.480	73.802	74.999	76.647	78.534	80.714	82.716	84.776	86.945	89.664
84	71.678	73.988	75.351	76.608	77.783	79.455	81.316	83.515	85.174	87.025	88.070	88.972
85	60.762	63.872	65.728	67.775	69.704	72.231	75.459	78.699	81.939	84.611	88.494	89.698
86	**62.102**	**64.836**	**69.726**	**70.503**	**71.664**	**74.514**	**77.523**	**82.117**	**84.071**	**84.910**	**85.660**	**85.177**
87	75.462	79.343	85.971	82.894	82.284	84.372	85.593	90.853	92.373	91.882	91.366	89.636
88	63.042	67.304	74.953	70.015	71.108	72.585	73.768	79.918	84.396	86.812	90.103	89.307
89	97.031	99.098	101.993	103.980	99.310	102.596	103.794	106.836	102.990	98.199	92.950	90.117
90	46.016	47.612	50.702	54.594	57.275	60.704	65.521	69.178	71.652	74.352	77.034	78.479
91	50.321	52.295	55.275	57.319	59.014	61.218	65.065	68.570	72.380	75.946	81.485	81.779
92	30.449	31.485	32.587	35.068	37.767	42.253	45.790	50.697	51.432	54.602	58.583	64.258
93	43.802	44.498	46.744	51.393	54.457	59.240	65.478	70.858	72.163	73.522	75.845	77.987
94	45.013	47.770	53.100	59.230	63.002	65.743	69.625	70.291	73.215	77.263	76.615	77.713
95	**61.488**	**64.426**	**67.158**	**69.489**	**72.092**	**74.479**	**76.639**	**78.786**	**80.394**	**82.357**	**83.942**	**86.539**
96	102.221	104.362	104.559	105.016	106.920	107.359	107.627	108.227	107.393	105.313	102.328	101.386
97	107.083	107.948	108.016	108.541	110.801	110.361	110.555	111.084	109.735	107.213	103.892	102.171
98	62.171	70.498	71.599	71.910	72.201	78.810	79.089	79.330	79.858	82.505	83.269	87.017
99	144.439	133.543	123.170	112.228	98.457	93.707	96.432	100.196	107.213	103.926	100.656	102.532
100	39.538	42.828	46.459	49.908	52.924	55.889	58.850	61.689	64.499	67.718	71.031	74.830
101	36.827	40.566	44.929	49.144	52.586	55.745	58.913	61.907	64.524	67.076	69.852	73.406
102	40.447	43.576	46.731	49.841	52.732	55.994	58.753	61.771	65.726	69.680	74.241	78.781
103	49.444	51.067	52.330	53.170	54.705	56.544	59.044	61.146	63.362	68.017	71.854	75.752
104	52.417	55.291	57.904	60.206	62.474	64.835	67.423	70.246	73.517	76.951	80.656	84.570
105	65.893	68.325	70.128	72.146	73.932	75.585	77.232	79.618	80.896	83.029	85.784	89.289
106	62.308	64.989	67.146	69.065	71.002	73.276	75.418	77.463	79.901	82.311	86.034	88.456

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1	**72.147**	**74.755**	**76.954**	**78.643**	**80.265**	**82.041**	**83.826**	**85.395**	**86.207**	**87.596**	**89.777**	**91.488**
107	61.384	64.710	67.018	68.987	70.285	72.607	74.756	76.670	78.799	81.201	84.710	88.391
108	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109	63.247	67.255	70.418	70.809	72.936	75.103	77.055	77.982	76.183	78.319	78.897	79.810
110	67.447	71.755	73.594	74.634	75.350	76.524	78.535	80.464	81.513	83.690	87.670	88.457
111	**93.192**	**86.681**	**79.268**	**75.320**	**75.252**	**75.316**	**76.668**	**79.859**	**85.104**	**88.129**	**92.985**	**97.282**
112	61.571	64.430	66.767	68.823	70.801	72.809	74.808	76.723	79.019	81.179	84.377	87.611
113	54.117	58.676	63.096	66.607	69.112	71.652	73.828	75.372	76.845	78.744	81.427	84.316

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	2002	2003	2004	2005	2006	2007	2008
1	**92.736**	**94.622**	**97.098**	**100.000**	**102.746**	**105.502**	**109.031**
2	**96.430**	**96.380**	**97.867**	**100.000**	**101.508**	**102.789**	**106.150**
3	**106.672**	**102.907**	**101.005**	**100.000**	**98.488**	**96.714**	**95.537**
4	**101.855**	**99.074**	**98.399**	**100.000**	**100.126**	**99.483**	**98.523**
5	101.639	100.176	99.509	100.000	99.356	98.313	96.842
6	104.564	97.368	96.195	100.000	100.096	98.501	95.731
7	96.287	97.225	97.716	100.000	104.051	107.587	113.224
8	**104.102**	**101.176**	**99.938**	**100.000**	**99.483**	**98.665**	**98.049**
9	104.750	102.191	100.936	100.000	99.354	97.557	95.983
10	103.974	100.750	97.254	100.000	102.494	105.850	106.950
11	104.901	100.724	100.571	100.000	96.347	94.609	95.725
12	98.308	96.109	97.162	100.000	101.114	101.331	100.443
13	**118.150**	**110.805**	**105.521**	**100.000**	**94.230**	**88.301**	**84.337**
14	134.019	120.171	110.262	100.000	89.703	80.267	72.871
15	103.229	102.380	101.139	100.000	98.738	97.310	99.570
16	98.823	98.046	98.412	100.000	102.351	101.542	102.617
17	100.986	100.187	100.393	100.000	99.363	100.203	101.888
18	102.323	101.384	100.128	100.000	99.888	97.287	98.491
19	**103.257**	**101.604**	**101.383**	**100.000**	**101.938**	**106.078**	**111.534**
20	104.513	100.926	101.463	100.000	102.469	107.626	115.088
21	96.524	96.813	98.395	100.000	102.321	103.969	104.940
22	86.817	91.743	95.991	100.000	106.342	115.048	123.073
23	115.443	115.180	108.889	100.000	102.038	112.211	127.154
24	135.743	120.940	108.562	100.000	90.991	84.373	80.873
25	**90.878**	**92.791**	**96.120**	**100.000**	**103.215**	**106.250**	**112.188**
26	**93.528**	**95.296**	**98.267**	**100.000**	**101.709**	**105.623**	**111.926**
27	93.297	95.097	98.171	100.000	101.778	105.941	112.795
28	95.027	96.556	98.854	100.000	101.326	103.806	107.058
29	74.231	84.025	97.109	100.000	96.420	104.647	103.178
30	**103.851**	**101.270**	**100.926**	**100.000**	**99.573**	**98.638**	**97.823**
31	104.850	102.029	101.646	100.000	99.352	98.472	97.196
32	104.528	102.049	101.949	100.000	99.937	99.563	97.041
33	104.875	101.628	101.171	100.000	98.337	96.833	97.409
34	108.291	104.587	101.537	100.000	99.851	97.663	97.503
35	99.407	97.863	97.687	100.000	100.585	99.400	100.737
36	**59.378**	**69.370**	**81.537**	**100.000**	**112.926**	**122.378**	**143.694**

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	2002	2003	2004	2005	2006	2007	2008
1	**92.736**	**94.622**	**97.098**	**100.000**	**102.746**	**105.502**	**109.031**
37	59.915	69.782	82.086	100.000	112.842	122.411	142.242
38	53.051	64.182	74.736	100.000	114.090	121.874	166.173
39	**97.125**	**97.307**	**98.479**	**100.000**	**102.161**	**103.539**	**106.098**
40	91.689	94.305	97.049	100.000	104.027	105.520	107.956
41	106.342	103.197	102.695	100.000	99.365	98.638	100.170
42	103.269	99.991	99.210	100.000	101.127	100.395	102.712
43	100.664	99.681	99.798	100.000	100.876	102.373	103.021
44	92.202	93.282	95.065	100.000	103.414	110.241	117.104
45	97.208	97.668	98.261	100.000	101.472	102.807	105.021
46	.....	.....	.....	.....	.....	.....	.....
47	**90.807**	**93.692**	**96.687**	**100.000**	**103.411**	**106.964**	**110.582**
48	**90.505**	**93.572**	**96.707**	**100.000**	**103.463**	**107.105**	**110.838**
49	**91.297**	**94.164**	**96.660**	**100.000**	**104.282**	**108.047**	**111.926**
50	93.043	95.383	97.607	100.000	103.599	107.438	110.443
51	92.125	94.689	97.085	100.000	103.562	107.957	111.841
52	93.285	95.563	97.740	100.000	103.473	106.976	109.668
53	93.281	95.572	97.756	100.000	111.192	125.862	133.103
54	91.861	94.563	97.083	100.000	103.584	107.998	111.945
55	82.423	87.918	91.779	100.000	107.940	111.295	119.972
56	86.480	89.661	95.006	100.000	104.934	110.244	116.733
57	81.032	87.340	90.689	100.000	108.977	111.640	121.090
58	90.321	92.456	94.171	100.000	112.053	116.458	123.909
59	62.845	77.129	83.633	100.000	102.459	101.417	115.174
60	**90.065**	**93.481**	**96.932**	**100.000**	**103.039**	**106.840**	**109.726**
61	93.179	95.134	97.562	100.000	101.862	105.621	108.002
62	94.797	96.273	98.238	100.000	100.954	105.098	106.210
63	86.737	90.289	94.737	100.000	105.208	110.624	116.313
64	93.495	95.455	97.711	100.000	101.904	104.419	107.442
65	87.282	91.967	96.348	100.000	104.150	107.989	111.357
66	86.806	91.854	96.338	100.000	104.377	108.023	111.233
67	89.598	92.519	96.395	100.000	102.988	107.836	112.038
68	**93.072**	**95.070**	**96.459**	**100.000**	**104.215**	**106.622**	**112.403**
69	94.094	95.792	97.155	100.000	103.515	106.344	111.154
70	91.933	94.530	96.733	100.000	104.211	107.749	112.995
71	100.375	99.517	98.380	100.000	101.633	102.666	106.406

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	2002	2003	2004	2005	2006	2007	2008
1	**92.736**	**94.622**	**97.098**	**100.000**	**102.746**	**105.502**	**109.031**
72	90.302	93.137	94.598	100.000	106.130	107.384	115.786
73	86.596	91.570	95.997	100.000	104.699	106.315	111.373
74	91.409	93.590	93.606	100.000	107.334	108.489	119.566
75	109.477	100.400	98.818	100.000	99.627	99.109	97.477
76	**91.943**	**94.761**	**97.270**	**100.000**	**103.370**	**106.213**	**109.517**
77	91.738	95.119	97.410	100.000	103.610	106.916	109.797
78	93.041	95.619	98.058	100.000	103.166	104.739	107.172
79	92.118	94.223	96.739	100.000	103.225	106.186	110.214
80	89.421	92.827	96.248	100.000	103.532	107.842	112.821
81	**91.818**	**93.773**	**96.889**	**100.000**	**103.350**	**107.348**	**111.599**
82	92.103	94.138	96.989	100.000	103.188	106.985	111.681
83	92.125	94.122	96.978	100.000	103.182	106.989	111.697
84	91.248	94.780	97.397	100.000	103.407	106.867	111.110
85	89.899	91.304	96.227	100.000	104.402	109.710	111.124
86	**87.519**	**91.480**	**96.488**	**100.000**	**102.303**	**106.726**	**109.986**
87	91.773	94.386	97.264	100.000	102.169	106.185	109.941
88	92.625	95.810	97.657	100.000	101.128	105.440	110.188
89	90.861	92.841	96.838	100.000	103.233	106.958	109.682
90	81.140	87.147	95.327	100.000	102.509	107.592	110.020
91	88.044	91.641	96.098	100.000	102.862	106.059	106.724
92	71.583	89.131	95.115	100.000	101.266	106.316	112.828
93	78.492	85.262	96.196	100.000	103.684	108.407	111.342
94	80.107	85.969	92.212	100.000	99.198	107.789	110.851
95	**89.912**	**93.234**	**96.358**	**100.000**	**103.422**	**106.374**	**110.819**
96	102.240	102.273	100.759	100.000	100.058	97.734	99.408
97	102.715	102.258	100.703	100.000	100.634	102.431	104.140
98	91.728	96.587	98.649	100.000	105.902	109.440	115.871
99	103.407	104.282	101.717	100.000	95.632	76.535	77.244
100	79.654	85.830	93.155	100.000	106.339	112.362	118.874
101	78.415	84.983	93.034	100.000	106.700	113.382	120.457
102	83.882	89.009	94.327	100.000	105.722	111.224	117.270
103	79.679	85.540	92.346	100.000	105.685	109.914	114.943
104	88.665	92.393	95.981	100.000	104.655	108.910	113.343
105	91.376	93.590	96.313	100.000	103.609	107.328	112.683
106	91.163	93.751	96.179	100.000	103.329	106.648	109.857

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Line	2002	2003	2004	2005	2006	2007	2008
1	**92.736**	**94.622**	**97.098**	**100.000**	**102.746**	**105.502**	**109.031**
107	91.334	93.754	96.101	100.000	103.593	106.183	109.580
108	.....	.....	.....	.....	.....	.....	.....
109	82.524	87.678	93.655	100.000	104.246	111.007	120.020
110	88.579	91.275	95.306	100.000	104.743	108.903	114.220
111	**98.066**	**96.567**	**96.198**	**100.000**	**102.104**	**103.525**	**104.531**
112	90.203	93.108	96.179	100.000	103.617	106.807	109.691
113	87.498	91.913	96.172	100.000	104.129	107.947	111.530

Source Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4

Appendix F: National Income and Product Accounts, Reinexed, Base Year 1961

Line	Item	Category	Item Code	1961
1	Personal consumption expenditures		DPCERG3	100.000
2	Goods		DGDSRG3	100.000
3	Durable goods	Durable	DDURRG3	100.000
4	Motor vehicles and parts	Durable	DMOTRG3	100.000
5	New motor vehicles (55)	Durable	DNMVRG3	100.000
6	Net purchases of used motor vehicles (56)	Durable	DNPVRG3	100.000
7	Motor vehicle parts and accessories (58)	Durable	DMVPRG3	100.000
8	Furnishings and durable household equipment	Durable	DFDHRG3	100.000
9	Furniture and furnishings (parts of 31 and 32)	Durable	DFFFRG3	100.000
10	Household appliances (part of 33)	Durable	DAPPRG3	100.000
11	Glassware, tableware, and household utensils (34)	Durable	DUTERG3	100.000
12	Tools and equipment for house and garden (35)	Durable	DTOORG3	100.000
13	Recreational goods and vehicles	Durable	DREQRG3	100.000
14	Video, audio, photographic, and information processing equipment and media (75, 76, and part of 93)	Durable	DVAPRG3	100.000
15	Sporting equipment, supplies, guns, and ammunition (part of 80)	Durable	DSPGRG3	100.000
16	Sports and recreational vehicles (79)	Durable	DWHLRG3	100.000
17	Recreational books (part of 90)	Durable	DRBKRG3	100.000
18	Musical instruments (part of 80)	Durable	DMSCRG3	100.000
19	Other durable goods	Durable	DODGRG3	100.000
20	Jewelry and watches (part of 119)	Durable	DJRYRG3	100.000
21	Therapeutic appliances and equipment (42)	Durable	DTAERG3	100.000
22	Educational books (96)	Durable	DEBKRG3	100.000
23	Luggage and similar personal items (part of 119)	Durable	DLUGRG3	100.000
24	Telephone and facsimile equipment (67)	Durable	DTCERG3	100.000
25	Nondurable goods	NonDurable	DNDGRG3	100.000
26	Food and beverages purchased for off-premises consumption	NonDurable	DFXARG3	100.000
27	Food and nonalcoholic beverages purchased for off-premises consumption (4)	NonDurable	DTFDRG3	100.000
28	Alcoholic beverages purchased for off-premises consumption (5)	NonDurable	DAOPRG3	100.000
29	Food produced and consumed on farms (6)	NonDurable	DFFDRG3	100.000
30	Clothing and footwear	NonDurable	DCLORG3	100.000
31	Garments	NonDurable	DGARRG3	100.000
32	Women's and girls' clothing (10)	NonDurable	DWGCRG3	100.000
33	Men's and boys' clothing (11)	NonDurable	DMBCRG3	100.000
34	Children's and infants' clothing (12)	NonDurable	DCICRG3	100.000
35	Other clothing materials and footwear (13 and 17)	NonDurable	DOCCRG3	100.000

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	Item	Category	Item Code	1961
1	Personal consumption expenditures		DPCERG3	100.000
36	Gasoline and other energy goods	NonDurable	DGOERG3	100.000
37	Motor vehicle fuels, lubricants, and fluids (59)	NonDurable	DMFLRG3	100.000
38	Fuel oil and other fuels (29)	NonDurable	DFULRG3	100.000
39	Other nondurable goods	NonDurable	DONGRG3	100.000
40	Pharmaceutical and other medical products (40 and 41)	NonDurable	DPHMRG3	100.000
41	Recreational items (parts of 80, 92, and 93)	NonDurable	DREIRG3	100.000
42	Household supplies (parts of 32 and 36)	NonDurable	DHOURG3	100.000
43	Personal care products (part of 118)	NonDurable	DOPCRG3	100.000
44	Tobacco (127)	NonDurable	DTOBRG3	100.000
45	Magazines, newspapers, and stationery (part of 90)	NonDurable	DNEWRG3	100.000
47	Services	Services	DSERRG3	100.000
48	Household consumption expenditures (for services)	Services	DHCERG3	100.000
49	Housing and utilities	Services	DHUTRG3	100.000
50	Housing	Services	DHSGRG3	100.000
51	Rental of tenant-occupied nonfarm housing (20)	Services	DTENRG3	100.000
52	Imputed rental of owner-occupied nonfarm housing (21)	Services	DOWNRG3	100.000
53	Rental value of farm dwellings (22)	Services	DFARRG3	100.000
54	Group housing (23)	Services	DGRHRG3	100.000
55	Household utilities	Services	DUTLRG3	100.000
56	Water supply and sanitation (25)	Services	DWRSRG3	100.000
57	Electricity and gas	Services	DELGRG3	100.000
58	Electricity (27)	Services	DELCRG3	100.000
59	Natural gas (28)	Services	DGHERG3	100.000
60	Health care	Services	DHLCRG3	100.000
61	Outpatient services	Services	DOUTRG3	100.000
62	Physician services (44)	Services	DPHYRG3	100.000
63	Dental services (45)	Services	DDENRG3	100.000
64	Paramedical services (46)	Services	DPMSRG3	100.000
65	Hospital and nursing home services	Services	DHPNRG3	100.000
66	Hospitals (51)	Services	DHSPRG3	100.000
67	Nursing homes (52)	Services	DNRSRG3	100.000
68	Transportation services	Services	DTRSRG3	100.000
69	Motor vehicle services	Services	DMVSRG3	100.000
70	Motor vehicle maintenance and repair (60)	Services	DVMRRG3	100.000
71	Other motor vehicle services (61)	Services	DOVSRG3	100.000

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	Item	Category	Item Code	1961
1	Personal consumption expenditures		DPCERG3	100.000
72	Public transportation	Services	DPUBRG3	100.000
73	Ground transportation (63)	Services	DGRDRG3	100.000
74	Air transportation (64)	Services	DAITRG3	100.000
75	Water transportation (65)	Services	DWATRG3	100.000
76	Recreation services	Services	DRCARG3	100.000
77	Membership clubs, sports centers, parks, theaters, and museums (82)	Services	DRLSRG3	100.000
78	Audio-video, photographic, and information processing equipment services (parts of 77 and 93)	Services	DAVPRG3	100.000
79	Gambling (91)	Services	DGAMRG3	100.000
80	Other recreational services (81, 94, and part of 92)	Services	DOTRRG3	100.000
81	Food services and accommodations	Services	DFSARG3	100.000
82	Food services	Services	DFSERG3	100.000
83	Purchased meals and beverages (102)	Services	DPMBRG3	100.000
84	Food furnished to employees (including military) (103)	Services	DFOORG3	100.000
85	Accommodations (104)	Services	DACCRG3	100.000
86	Financial services and insurance	Services	DIFSRG3	100.000
87	Financial services	Services	DFNLRG3	100.000
88	Financial services furnished without payment (107)	Services	DIMPRG3	100.000
89	Financial service charges, fees, and commissions (108)	Services	DOFIRG3	100.000
90	Insurance	Services	DINSRG3	100.000
91	Life insurance (110)	Services	DLIFRG3	100.000
92	Net household insurance (111)	Services	DFINRG3	100.000
93	Net health insurance (112)	Services	DHINRG3	100.000
94	Net motor vehicle and other transportation insurance (116)	Services	DTINRG3	100.000
95	Other services	Services	DOTSRG3	100.000
96	Communication	Services	DCOMRG3	100.000
97	Telecommunication services (71)	Services	DTCSRG3	100.000
98	Postal and delivery services (68)	Services	DPSSRG3	100.000
100	Education services	Services	DTEDRG3	100.000
101	Higher education (97)	Services	DHEDRG3	100.000
102	Nursery, elementary, and secondary schools (98)	Services	DNEHRG3	100.000
103	Commercial and vocational schools (99)	Services	DVEDRG3	100.000
104	Professional and other services (121)	Services	DPRSRG3	100.000
105	Personal care and clothing services (14 and parts of 17 and 118)	Services	DPERRG3	100.000
106	Social services and religious activities (120)	Services	DSOCRG3	100.000

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	Item	Category	Item Code	1961
1	Personal consumption expenditures		DPCERG3	100.000
107	Household maintenance (parts of 31, 33, and 36)	Services	DHHMRG3	100.000
109	Foreign travel by U.S. residents (129)	Services	DFTRRG3	100.000
110	Less: Expenditures in the United States by nonresidents (130)	Services	DEXFRG3	100.000
111	Final consumption expenditures of nonprofit institutions serving households (NPISHs) \1\	Services	DNPIRG3	100.000
112	Gross output of nonprofit institutions (133) \2\	Services	DNPERG3	100.000
113	Less: Receipts from sales of goods and services by nonprofit institutions (134) \3\	Services	DNPSRG3	100.000

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1	101.181	102.362	103.861	105.367	108.042	110.760	115.079	120.291	125.919	131.270	135.764	143.083
2	100.516	101.350	102.454	103.531	105.811	107.678	111.431	115.749	120.165	123.775	126.944	134.516
3	100.430	100.815	101.268	100.438	100.219	101.828	105.091	108.055	110.384	114.197	115.455	117.165
4	101.629	102.429	103.264	102.420	101.727	103.115	106.669	108.815	112.102	117.522	117.815	118.354
5	99.594	98.998	98.741	96.531	94.752	95.625	98.330	99.866	102.712	106.988	106.208	106.240
6	113.601	122.204	131.341	135.316	139.917	143.593	152.748	157.620	160.609	176.365	185.783	199.031
7	100.218	101.846	101.912	105.780	107.980	110.624	114.683	118.395	124.052	128.615	129.471	126.117
8	99.881	99.928	100.039	99.395	100.219	102.473	106.497	110.301	112.701	114.738	116.371	119.113
9	100.236	100.495	100.884	100.926	102.775	106.089	110.146	114.536	116.945	118.947	120.557	124.095
10	97.692	95.841	94.770	92.546	90.996	91.069	92.991	95.034	97.380	99.382	99.899	100.000
11	102.578	106.009	107.963	107.921	110.211	113.432	122.251	127.342	131.351	135.227	141.220	149.263
12	101.684	102.168	101.450	99.638	97.782	97.589	101.584	105.625	105.023	104.069	103.944	104.172
13	98.904	98.706	97.511	96.167	95.100	95.675	97.552	99.799	99.934	103.488	104.988	106.596
14	97.027	95.775	95.424	92.435	88.744	87.485	87.082	86.992	87.012	87.548	88.221	88.119
15	100.851	101.229	97.229	97.240	99.893	103.597	109.255	113.958	114.333	114.046	111.912	113.334
16	100.998	102.319	103.021	103.378	104.981	107.614	111.391	115.933	111.875	125.717	130.238	136.089
17	100.664	102.089	99.384	101.449	104.819	107.747	113.314	120.530	127.281	134.895	141.507	145.655
18	101.708	103.013	102.448	101.667	101.460	103.632	109.394	117.385	122.765	128.503	130.548	131.374
19	99.579	100.101	102.667	102.142	102.114	104.540	106.841	112.131	115.045	118.203	122.025	126.009
20	100.058	100.636	106.824	103.841	98.983	100.183	103.291	109.143	111.027	113.141	115.923	120.021
21	100.167	100.159	100.733	101.840	103.688	106.479	108.761	112.020	116.741	121.741	124.691	127.693
22	97.960	97.845	97.880	102.682	107.748	111.255	116.997	123.507	128.195	136.768	145.777	150.533
23	98.790	99.829	98.988	99.596	105.190	109.445	109.363	114.760	117.683	119.942	124.873	129.134
24	97.962	97.842	97.874	102.708	107.721	111.279	116.990	123.471	128.058	136.787	145.845	150.495
25	100.544	101.546	102.902	104.756	108.112	110.084	114.051	118.984	124.335	127.844	131.943	142.584
26	100.756	101.815	103.870	105.969	110.440	110.579	113.927	119.035	125.675	128.540	134.668	151.714
27	100.773	101.909	104.240	106.417	111.230	111.246	114.697	120.130	127.232	130.035	136.710	156.157
28	100.470	101.449	102.037	102.644	103.808	105.311	107.690	110.042	113.757	117.011	118.971	120.937
29	101.755	98.803	95.562	105.406	116.199	111.662	117.988	129.442	131.175	133.089	156.594	205.265
30	100.299	101.180	102.134	103.023	105.871	110.234	116.463	122.763	127.329	131.857	134.250	138.706
31	100.072	100.927	101.982	102.692	104.910	109.060	115.299	121.349	125.484	130.018	132.095	136.247
32	99.845	100.484	101.328	101.739	103.683	108.102	114.333	119.572	123.218	128.333	130.557	134.245
33	100.544	101.819	103.276	104.520	107.283	111.135	117.494	125.053	130.161	133.860	135.602	140.528
34	98.030	97.999	98.344	98.845	99.627	100.714	105.018	108.383	110.446	112.835	116.062	119.922
35	101.199	102.173	102.710	104.358	109.889	115.173	121.353	128.712	135.148	139.631	143.450	149.266

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1	101.181	102.362	103.861	105.367	108.042	110.760	115.079	120.291	125.919	131.270	135.764	143.083
36	100.511	100.757	99.824	103.231	105.688	109.131	111.130	114.537	116.140	118.042	119.442	131.901
37	100.623	100.383	99.728	103.498	105.879	109.377	110.990	114.649	115.671	116.518	118.027	129.313
38	100.121	102.011	100.151	102.344	105.035	108.301	111.748	114.106	118.506	126.036	126.822	145.358
39	100.330	101.722	103.232	104.665	106.753	109.366	113.557	117.758	123.253	127.974	131.160	134.737
40	97.091	95.409	94.932	94.589	94.792	94.107	93.999	95.050	96.994	98.232	98.307	98.414
41	101.658	103.126	105.281	105.399	106.181	108.543	113.545	118.927	123.363	128.123	131.362	133.700
42	99.691	100.088	100.057	100.454	101.971	104.656	107.676	110.059	114.334	118.597	120.592	123.467
43	100.930	101.257	101.384	100.988	99.720	101.460	104.545	109.260	111.995	115.639	118.698	121.826
44	100.793	103.855	106.316	110.827	116.815	121.189	128.817	135.694	147.040	153.260	161.640	166.111
45	101.653	106.002	111.770	115.165	119.171	123.838	130.502	135.722	144.223	153.310	156.095	161.499
47	101.902	103.464	105.395	107.370	110.487	114.168	119.100	125.306	132.256	139.473	145.389	152.441
48	101.924	103.486	105.471	107.410	110.497	114.179	119.137	125.294	132.305	139.519	145.450	152.422
49	101.077	102.153	103.062	103.939	105.376	107.187	109.639	113.155	118.077	124.126	128.830	134.611
50	101.225	102.467	103.513	104.540	106.123	108.161	110.813	114.475	119.368	124.912	129.416	134.918
51	101.236	102.363	103.267	104.327	105.810	107.636	110.288	113.802	118.581	123.981	128.315	133.950
52	101.166	102.289	103.275	104.268	105.732	107.680	110.310	113.795	118.534	123.997	128.349	133.889
53	102.060	106.142	109.172	110.441	114.967	120.621	123.830	132.245	141.556	150.169	159.780	162.733
54	101.095	102.547	103.490	105.021	106.557	108.209	109.999	114.476	118.898	124.064	128.208	133.452
55	100.364	100.631	100.876	101.068	101.825	102.560	104.058	106.893	111.968	120.367	126.028	133.135
56	102.566	105.699	107.271	109.908	113.975	116.611	122.180	130.433	140.778	155.746	161.516	170.206
57	100.000	99.775	99.795	99.570	99.768	100.205	101.072	103.057	107.299	114.658	120.290	127.152
58	100.000	99.629	99.293	98.922	98.922	99.629	100.376	102.573	105.894	112.896	118.414	125.757
59	100.000	99.988	100.552	100.552	101.056	101.056	102.124	103.756	109.588	117.557	123.389	129.293
60	102.527	105.431	109.026	112.412	117.426	124.902	132.782	142.146	152.878	160.758	167.583	175.501
61	102.929	105.377	108.159	111.684	118.023	125.607	132.605	142.144	152.082	162.165	167.615	173.075
62	102.900	105.230	108.141	111.610	118.645	126.699	133.735	143.582	154.065	164.427	169.679	175.008
63	102.875	105.667	108.542	112.083	115.718	121.528	128.122	137.234	144.897	154.235	160.485	165.736
64	103.068	105.510	107.844	111.512	118.444	126.413	133.792	142.728	153.703	163.730	168.801	174.991
65	102.047	105.506	110.112	113.337	116.734	124.100	132.847	142.029	153.489	159.491	167.401	177.280
66	102.079	105.411	110.063	113.312	116.678	124.035	132.679	141.983	153.382	159.221	167.239	177.268
67	101.863	106.167	110.492	113.576	117.248	124.668	133.896	142.526	154.271	161.070	168.523	177.740
68	102.152	102.592	103.944	105.741	107.661	111.685	116.717	123.907	133.482	142.855	148.297	154.852
69	101.181	102.284	103.407	105.336	106.884	111.014	116.272	123.008	131.234	139.803	145.384	153.145
70	101.306	102.554	103.809	105.944	107.661	112.307	118.251	125.862	135.197	144.943	151.306	159.753
71	100.327	100.307	100.569	101.060	101.444	102.155	102.931	104.164	105.697	107.330	108.456	112.274

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1	101.181	102.362	103.861	105.367	108.042	110.760	115.079	120.291	125.919	131.270	135.764	143.083
72	103.956	103.115	104.912	106.443	109.103	112.923	117.522	125.543	137.625	148.558	153.716	158.016
73	103.586	105.096	107.798	109.831	113.777	119.885	126.250	134.134	149.121	161.577	168.671	171.279
74	105.155	97.568	97.127	97.557	97.790	97.915	100.000	107.626	115.872	124.494	127.489	132.751
75	101.406	103.973	105.141	108.413	112.650	116.129	121.460	129.633	140.129	147.583	154.171	160.942
76	102.380	104.596	107.523	109.715	112.603	116.543	122.779	127.995	133.907	139.795	143.377	148.468
77	103.348	106.647	111.101	114.701	119.197	124.506	132.105	139.774	149.489	157.130	162.236	168.574
78	100.887	101.369	101.874	101.354	100.769	102.590	106.698	107.268	107.050	109.571	110.363	111.977
79	101.179	102.447	103.804	105.421	108.608	111.606	116.369	122.673	129.871	135.393	139.831	148.634
80	101.586	102.836	105.555	108.720	113.037	117.329	125.116	131.511	136.708	146.644	151.324	156.756
81	102.487	104.703	106.327	108.419	112.610	118.856	125.059	132.541	142.342	149.934	155.478	166.106
82	102.589	104.930	106.587	108.700	113.067	119.427	125.658	133.127	142.951	150.683	156.416	167.470
83	102.581	104.921	106.578	108.669	112.985	119.386	125.622	133.068	142.882	150.633	156.350	167.338
84	102.648	105.058	106.826	109.229	114.323	120.129	126.347	134.123	144.086	151.492	157.570	169.992
85	100.844	101.131	102.289	104.129	105.952	110.736	116.454	124.111	133.465	139.246	142.576	148.582
86	104.121	104.240	108.600	111.360	118.075	120.788	129.730	141.329	148.584	157.494	167.144	171.090
87	106.093	105.549	111.337	112.066	120.641	122.602	130.322	148.027	154.646	158.658	166.396	170.210
88	102.622	94.605	103.498	108.010	117.061	122.822	123.277	147.078	156.799	154.308	160.400	168.548
89	111.799	125.168	124.924	119.022	126.889	123.390	141.558	149.045	149.203	168.869	180.689	172.465
90	102.490	103.119	106.362	110.763	115.929	119.319	129.392	135.470	143.312	156.873	168.463	172.556
91	103.389	105.787	109.778	112.575	116.609	120.676	127.657	133.993	142.040	148.300	156.046	164.576
92	101.888	108.371	119.336	137.762	154.572	172.225	184.236	194.700	205.664	227.662	236.783	236.306
93	103.186	99.848	101.988	107.298	113.124	114.323	137.005	140.707	144.257	167.122	191.564	192.277
94	100.308	101.188	103.553	108.986	114.848	118.390	121.150	128.949	140.717	155.862	160.141	161.362
95	101.633	103.837	106.151	108.872	112.020	115.602	120.714	126.562	132.658	140.490	147.682	156.362
96	100.113	102.034	102.609	101.466	99.639	101.141	102.877	104.463	105.622	112.388	118.794	121.659
97	99.991	100.021	100.157	98.739	96.565	97.842	97.847	99.137	100.293	105.217	111.141	113.984
98	100.924	115.820	119.577	120.518	121.485	124.767	141.494	145.725	146.779	171.572	182.159	184.706
100	102.529	105.007	107.588	111.270	116.259	121.077	126.617	134.360	143.651	151.308	159.119	171.198
101	103.793	107.585	111.624	116.482	122.345	128.577	136.367	145.551	155.761	165.498	174.662	184.235
102	101.236	102.399	102.989	105.388	109.467	112.438	115.409	122.569	133.180	139.731	146.872	167.079
103	101.371	102.700	104.971	107.645	111.785	115.720	119.311	124.256	129.159	132.742	137.756	144.810
104	101.759	103.913	107.641	111.579	114.452	119.133	123.851	131.988	142.378	151.715	162.316	174.279
105	101.462	103.888	106.314	109.391	114.838	120.549	126.315	132.996	139.642	144.113	146.746	154.051
106	101.019	102.707	103.976	106.319	109.033	111.794	116.452	123.621	128.259	134.841	141.180	149.092

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1	101.181	102.362	103.861	105.367	108.042	110.760	115.079	120.291	125.919	131.270	135.764	143.083
107	102.402	104.217	107.252	111.705	117.264	121.649	131.928	141.147	151.944	160.767	168.255	178.580
109	102.763	105.299	107.426	111.740	115.853	115.017	120.077	122.761	124.582	136.296	144.739	158.358
110	101.038	102.156	103.757	105.297	108.377	111.531	116.138	122.305	129.717	134.679	139.279	147.161
111	101.416	103.046	103.517	106.404	110.310	113.889	118.249	125.609	131.057	138.245	143.900	153.148
112	101.887	104.341	106.866	109.966	113.793	119.002	125.266	133.434	142.133	148.964	155.989	165.973
113	102.124	104.988	108.537	111.751	115.523	121.517	128.699	137.250	147.436	154.115	161.758	172.097

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1	157.986	171.182	180.576	192.304	205.771	224.020	248.077	270.252	285.171	297.447	308.696	318.802
2	151.304	163.529	169.928	179.000	189.984	207.951	231.238	248.416	255.188	259.792	264.708	268.954
3	124.857	136.031	143.471	149.898	158.291	168.782	183.428	195.694	203.327	207.446	210.513	212.741
4	125.642	138.058	148.614	157.296	168.200	180.880	194.287	209.317	219.240	226.055	232.517	237.903
5	112.167	122.255	129.863	136.709	147.027	158.384	170.784	180.920	187.993	192.814	198.426	205.077
6	215.684	248.284	285.566	307.244	327.230	340.007	341.963	410.350	457.801	521.280	574.889	576.193
7	134.637	146.836	157.252	167.854	175.666	192.795	214.284	225.149	230.647	224.109	215.474	215.362
8	128.820	141.627	147.721	153.168	160.918	170.957	184.845	198.506	208.738	213.600	216.189	218.560
9	134.897	145.572	150.437	156.128	163.726	173.781	189.403	203.303	212.916	217.685	222.195	227.193
10	105.117	116.744	123.225	127.704	134.227	141.538	148.598	157.213	166.858	171.717	172.050	168.262
11	168.617	197.348	209.879	218.685	234.478	253.789	280.185	308.234	321.140	327.164	327.833	329.193
12	110.671	120.940	125.236	127.867	130.638	137.829	147.281	157.521	169.244	173.273	173.421	179.016
13	111.319	118.687	122.774	126.306	130.837	136.661	144.256	150.724	154.204	152.358	150.202	147.562
14	89.702	92.289	93.391	93.617	94.988	97.329	99.595	101.417	100.693	95.884	91.639	86.790
15	117.494	124.762	128.778	131.857	135.304	141.181	150.348	158.886	163.439	165.329	165.359	162.875
16	151.473	167.057	175.366	186.358	197.812	211.230	231.158	245.701	255.460	258.695	267.638	275.252
17	148.451	176.173	199.203	217.789	237.939	256.965	282.302	311.901	347.262	372.689	380.255	407.705
18	137.315	147.710	151.281	153.086	159.747	167.877	180.790	193.425	203.515	205.616	206.463	205.643
19	135.703	146.018	153.134	159.848	168.723	182.642	219.997	232.103	234.340	241.898	247.062	249.758
20	126.935	136.048	140.511	142.518	150.089	163.763	204.666	212.977	207.985	211.348	212.785	210.649
21	134.841	145.883	154.786	164.160	173.709	183.503	199.361	215.000	229.507	240.742	249.927	259.923
22	155.771	165.983	177.181	188.413	203.358	216.332	234.453	263.072	297.146	327.358	353.903	383.759
23	146.600	158.615	169.271	184.492	194.279	211.547	264.875	275.718	269.353	273.765	275.509	272.808
24	155.904	166.065	177.259	188.006	204.453	217.054	235.063	263.403	297.261	327.060	353.661	383.383
25	164.144	176.831	182.589	193.049	205.391	227.527	255.443	275.171	281.415	286.243	292.192	297.665
26	174.782	187.923	191.415	202.691	222.084	243.895	264.402	283.243	290.694	294.031	302.865	306.163
27	182.494	196.476	200.037	213.150	234.559	258.087	280.027	300.300	307.538	309.963	319.783	322.803
28	128.416	137.213	140.152	142.337	149.987	161.733	175.221	186.864	194.578	201.876	205.714	210.351
29	183.125	187.171	192.259	193.002	247.053	296.660	285.367	283.834	292.340	276.969	288.324	270.059
30	148.997	155.678	160.671	167.529	170.695	174.036	180.418	186.376	189.106	191.694	192.689	196.823
31	146.800	153.476	158.195	164.871	167.531	169.023	173.870	178.970	181.321	184.257	185.150	189.674
32	143.399	148.913	152.832	158.347	160.750	161.301	163.961	166.193	166.288	168.013	167.924	171.911
33	151.533	158.133	163.740	171.328	173.947	176.761	184.112	192.783	198.602	202.726	205.219	209.867
34	151.421	181.916	191.734	210.261	218.368	222.724	240.947	261.959	271.482	284.994	289.231	302.041
35	158.271	164.927	171.217	178.901	184.542	197.072	211.166	221.436	226.121	226.732	228.258	230.038

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1	157.986	171.182	180.576	192.304	205.771	224.020	248.077	270.252	285.171	297.447	308.696	318.802
36	183.429	196.311	205.706	220.393	230.536	310.531	431.804	487.039	464.418	446.474	441.851	442.802
37	174.688	186.414	194.337	205.591	214.521	287.484	399.002	443.962	421.502	407.724	401.621	404.864
38	230.995	250.650	268.854	304.218	321.666	443.468	622.725	761.854	747.127	688.812	704.143	676.686
39	147.995	164.990	173.526	183.582	193.567	206.222	225.057	244.134	263.031	281.144	291.567	302.845
40	101.473	109.322	115.741	123.038	131.851	140.830	153.276	170.099	187.994	204.570	219.807	235.425
41	140.410	149.610	154.549	158.592	165.024	175.333	193.002	209.095	219.167	222.872	225.759	229.246
42	144.455	173.517	185.792	200.183	211.638	226.502	247.697	267.862	285.159	295.847	302.219	311.036
43	135.264	152.305	161.056	170.095	178.556	190.072	205.823	224.572	242.264	255.618	263.607	271.239
44	174.204	186.617	194.532	203.896	215.161	227.628	244.976	264.197	293.233	349.966	372.372	393.725
45	187.893	210.301	219.603	232.015	241.178	255.923	280.549	305.939	328.257	346.589	357.652	369.854
47	165.387	179.620	192.073	206.552	222.601	241.216	266.182	293.325	316.135	335.814	353.294	369.227
48	165.054	179.226	191.752	206.248	222.359	240.839	265.839	293.405	317.582	338.877	357.621	374.547
49	142.060	153.230	164.319	178.880	191.506	206.988	228.662	253.889	277.306	295.246	310.268	326.609
50	139.973	149.035	158.785	172.167	183.978	198.178	216.381	238.419	258.038	273.553	287.801	304.982
51	138.904	148.198	158.100	171.528	183.269	197.523	215.863	238.247	258.046	274.078	289.609	308.691
52	138.940	148.180	158.042	171.520	183.318	197.585	215.940	238.211	258.460	274.114	288.184	305.128
53	168.315	168.957	173.072	181.805	193.395	203.546	212.940	220.703	213.799	215.782	217.876	215.121
54	140.215	149.549	159.028	171.847	184.296	198.584	216.986	236.925	256.028	271.968	287.424	306.182
55	152.233	173.757	191.393	211.663	228.261	250.000	288.848	330.056	372.748	402.953	421.739	433.284
56	180.551	198.073	220.253	244.100	272.452	285.268	304.907	341.747	382.833	415.157	443.131	470.419
57	147.753	169.976	186.897	206.611	221.461	244.511	286.328	328.218	371.167	401.039	418.344	427.219
58	148.570	167.692	178.722	190.585	202.508	217.942	252.458	290.249	319.021	329.464	350.512	363.077
59	145.218	173.947	203.744	241.906	263.807	306.012	365.871	416.993	497.900	583.283	587.111	583.343
60	192.172	213.780	234.384	253.920	275.358	302.188	338.786	380.151	422.949	461.631	496.184	526.283
61	188.400	210.722	232.427	253.002	272.835	296.339	328.860	362.939	393.923	422.542	450.544	478.285
62	191.301	214.575	238.965	261.024	282.416	308.622	341.274	378.586	414.148	446.570	477.601	505.351
63	178.056	196.650	209.540	225.021	240.644	260.853	291.921	319.770	344.529	367.613	397.446	422.573
64	190.859	214.750	238.873	261.082	281.208	300.376	334.240	365.626	390.000	413.739	432.299	462.415
65	195.022	216.067	235.810	254.575	277.171	306.436	345.999	392.819	444.556	491.020	530.769	562.593
66	194.589	216.018	236.688	256.269	278.951	308.941	350.577	400.478	457.225	508.759	552.804	588.106
67	197.407	216.649	232.055	246.895	269.122	294.977	324.624	356.733	383.918	406.211	426.509	443.190
68	168.126	186.714	200.642	214.564	228.762	249.104	289.141	324.311	342.275	355.268	369.288	376.576
69	167.779	188.096	201.226	215.775	232.512	255.087	281.354	307.117	329.970	344.319	356.191	366.430
70	175.862	198.334	212.725	228.726	247.295	271.209	298.968	326.194	350.065	364.767	376.338	386.200
71	118.552	126.861	132.908	139.366	145.959	160.680	178.045	195.029	211.329	222.950	234.983	245.544

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1	157.986	171.182	180.576	192.304	205.771	224.020	248.077	270.252	285.171	297.447	308.696	318.802
72	168.949	184.584	199.937	212.777	222.471	238.853	304.134	357.880	365.724	375.883	394.351	394.827
73	180.767	198.173	214.369	229.313	241.597	259.604	300.506	352.123	387.330	406.228	430.926	447.199
74	143.715	156.510	169.735	179.883	186.983	200.645	271.440	320.282	312.928	317.702	331.300	325.257
75	174.239	190.483	205.179	220.251	236.914	248.925	266.364	280.464	292.135	302.290	311.566	322.923
76	158.764	170.467	178.907	187.466	198.673	211.794	227.813	242.329	255.541	266.634	278.161	290.165
77	181.167	195.476	207.165	219.057	233.828	248.886	265.752	280.810	296.568	311.486	325.886	340.923
78	116.032	122.244	125.446	128.016	133.391	140.651	150.689	159.490	167.271	173.040	180.158	188.482
79	164.903	179.981	190.503	202.802	216.672	236.969	262.723	287.150	303.952	316.452	329.386	340.512
80	169.117	182.365	191.608	201.885	213.007	225.868	242.240	257.390	271.466	282.195	293.247	304.475
81	185.320	202.011	215.382	230.976	251.170	278.284	305.237	332.504	351.514	366.698	383.236	399.707
82	187.516	204.673	218.032	233.661	253.365	280.111	306.352	333.120	350.605	365.486	380.858	396.095
83	187.306	204.423	217.750	233.324	252.973	279.619	305.767	332.470	349.929	364.799	380.159	395.406
84	191.714	209.551	223.727	240.390	261.112	289.855	318.158	346.119	364.061	379.299	394.746	409.684
85	158.842	170.521	183.573	198.420	222.980	253.043	286.490	318.034	351.903	369.722	397.415	425.242
86	184.797	198.473	206.484	222.347	251.695	265.402	285.935	307.542	325.298	356.651	379.204	395.386
87	194.385	214.153	214.363	221.048	257.193	277.410	305.298	324.689	329.957	357.528	366.372	380.728
88	200.117	218.048	214.288	221.407	258.551	280.041	301.200	312.190	305.802	338.144	349.362	362.270
89	173.441	199.340	213.673	218.763	251.102	266.655	315.766	359.676	398.238	411.220	412.729	431.217
90	176.168	183.713	200.370	226.791	248.860	255.628	268.598	292.689	323.869	361.028	404.451	423.709
91	176.614	189.372	204.238	223.021	241.835	259.596	281.067	299.215	317.330	341.340	362.790	396.644
92	213.217	216.674	256.051	286.852	293.176	313.057	350.796	385.396	428.594	468.631	489.445	518.995
93	189.288	190.017	197.846	245.881	284.236	264.618	263.647	306.312	374.708	442.816	531.073	526.915
94	161.230	168.797	197.261	210.493	220.205	240.112	254.718	264.826	272.030	294.974	324.241	347.910
95	173.273	185.693	197.300	207.433	218.316	234.167	255.438	281.587	303.506	320.638	336.957	349.232
96	128.389	132.506	140.296	141.960	144.646	145.087	147.306	162.623	179.507	189.529	201.774	208.991
97	118.799	122.637	126.998	128.442	129.886	129.443	131.628	144.173	158.839	168.853	181.153	186.477
98	213.515	219.957	277.547	281.960	305.164	322.064	323.074	378.756	424.085	425.147	426.339	463.307
100	193.668	210.668	226.032	240.743	253.424	275.619	306.297	342.206	380.798	413.386	449.088	483.001
101	200.123	214.965	229.787	244.916	258.405	279.069	305.638	343.501	389.770	430.340	474.395	517.589
102	201.347	224.230	243.883	258.406	266.950	290.736	325.946	363.019	403.303	436.852	474.202	510.519
103	170.438	185.558	196.940	210.963	226.948	251.316	287.820	317.082	330.522	338.227	348.496	355.258
104	190.019	203.864	216.384	230.266	246.118	267.864	303.963	342.477	382.551	427.950	462.799	489.833
105	169.644	183.568	195.662	208.504	226.759	251.015	279.312	306.438	326.585	341.132	357.863	373.754
106	170.060	185.303	196.058	208.729	222.696	244.501	276.156	302.201	315.621	323.824	334.571	342.118

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1	157.986	171.182	180.576	192.304	205.771	224.020	248.077	270.252	285.171	297.447	308.696	318.802
107	195.981	211.835	234.246	251.090	269.826	295.425	320.368	348.582	370.901	382.217	395.631	410.393
109	191.679	210.804	214.969	227.964	237.630	264.588	297.793	315.832	303.017	292.595	281.580	273.094
110	159.917	172.251	185.027	197.723	214.912	235.623	264.444	292.293	315.856	331.813	350.522	367.343
111	175.255	191.482	201.626	215.444	229.673	252.256	276.222	290.894	277.441	258.179	247.965	243.064
112	185.932	204.633	220.526	236.986	255.005	280.599	314.139	348.450	375.567	395.801	414.918	431.564
113	191.225	211.038	229.300	246.905	266.508	293.447	330.949	373.397	418.499	458.502	493.978	523.474

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1	326.573	338.221	351.689	366.970	383.740	397.612	409.308	418.292	426.919	436.365	445.859	454.205
2	267.696	276.303	283.588	294.500	306.560	314.053	317.841	320.603	323.864	326.890	330.482	330.096
3	215.081	221.268	224.919	229.017	231.293	234.682	236.303	238.628	243.301	245.074	242.601	237.301
4	244.463	255.648	259.665	267.337	268.197	275.742	280.947	292.010	305.567	317.672	324.039	325.261
5	213.960	220.283	223.807	228.866	233.783	242.901	249.173	256.412	265.792	272.403	277.716	279.549
6	568.378	650.113	659.703	699.303	661.215	667.980	673.821	741.320	815.892	890.609	918.645	921.145
7	214.719	216.452	219.820	224.489	225.273	227.298	228.787	225.056	223.781	224.558	224.185	222.985
8	220.862	224.352	227.552	228.230	230.539	231.853	234.599	235.844	239.485	239.113	239.791	239.436
9	230.750	234.965	240.062	241.562	244.822	246.272	250.715	253.264	257.486	258.877	260.489	260.084
10	167.437	168.701	169.074	169.010	167.946	166.170	165.084	165.521	167.594	166.294	166.026	165.235
11	338.080	346.359	348.982	354.251	361.229	369.573	376.929	374.877	379.855	372.383	368.032	365.658
12	175.957	176.404	176.543	170.320	171.794	173.680	173.463	173.485	176.562	176.607	179.550	182.126
13	142.879	141.074	140.170	139.796	138.662	136.902	132.696	127.936	125.270	120.005	111.499	102.167
14	81.252	78.535	75.456	73.346	70.086	66.719	62.165	57.853	54.804	50.303	43.793	37.512
15	161.428	163.887	169.693	173.153	179.438	186.387	187.550	185.687	188.608	187.303	185.394	183.864
16	275.163	276.524	285.346	293.940	301.151	307.258	313.721	317.034	324.442	333.516	336.327	334.004
17	426.218	435.173	448.970	465.352	491.444	508.091	520.566	533.959	544.224	553.541	573.866	580.581
18	206.420	209.687	219.550	227.000	229.392	229.657	232.499	234.502	236.469	232.868	235.265	232.736
19	255.659	273.064	290.894	304.420	323.607	335.586	344.445	347.097	352.640	358.510	356.371	351.372
20	212.619	228.571	240.955	250.025	264.959	273.227	276.501	274.488	276.229	273.141	263.353	253.109
21	270.159	283.310	295.403	307.517	321.235	334.198	347.526	357.367	364.237	375.244	381.162	386.561
22	415.186	446.246	477.513	508.321	549.719	578.235	610.063	631.370	654.189	679.255	717.845	752.779
23	275.250	294.694	335.293	359.289	392.937	407.878	418.627	417.986	428.493	458.059	459.157	439.749
24	414.822	446.233	477.665	508.434	549.670	578.275	610.069	631.488	654.300	679.579	718.073	752.900
25	293.861	303.854	313.516	329.068	347.930	358.091	363.292	366.248	368.198	372.047	380.472	384.443
26	313.370	323.253	332.897	350.450	367.570	379.110	382.019	387.366	393.852	402.387	414.663	422.562
27	330.161	341.208	351.702	371.374	389.874	397.570	399.548	405.855	413.739	423.844	437.152	445.705
28	216.377	220.236	225.440	232.345	242.035	270.269	277.704	277.986	277.644	278.382	285.207	289.552
29	274.035	299.294	304.301	320.526	345.697	331.785	318.989	327.403	302.239	301.659	303.976	322.333
30	196.012	201.660	208.148	211.193	218.079	222.228	223.882	222.687	218.939	213.825	211.251	211.316
31	188.979	194.674	200.519	202.713	209.708	213.626	214.571	213.102	209.172	203.642	200.943	201.293
32	169.805	176.128	181.037	181.363	188.626	191.234	191.871	190.457	186.427	179.546	175.146	174.937
33	210.772	215.504	222.573	228.167	233.384	239.629	241.130	240.260	236.650	233.658	233.788	235.693
34	315.166	315.160	326.591	333.136	350.762	357.046	358.443	349.447	345.507	343.041	347.455	341.778
35	228.595	233.764	243.655	251.427	257.444	262.757	268.480	268.966	266.490	264.102	262.393	260.772

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1	326.573	338.221	351.689	366.970	383.740	397.612	409.308	418.292	426.919	436.365	445.859	454.205
36	347.636	360.483	363.168	395.360	452.752	445.162	441.780	437.439	438.514	444.396	474.668	474.650
37	317.971	330.192	332.995	363.730	414.081	408.642	407.053	402.923	404.832	411.270	436.462	436.374
38	529.846	543.604	543.363	575.703	693.317	660.085	633.217	628.848	617.418	611.657	693.242	694.376
39	314.907	327.588	342.253	361.160	379.433	399.649	414.691	421.686	424.639	432.160	440.335	444.938
40	250.265	264.881	280.370	299.309	322.202	347.002	366.815	377.707	386.568	389.451	398.580	405.004
41	232.047	238.686	247.356	256.566	263.042	268.784	272.128	271.785	273.838	274.986	277.698	276.207
42	316.302	324.645	332.512	345.138	353.890	361.276	362.279	362.020	362.496	369.021	373.029	373.048
43	279.351	284.764	293.697	304.730	315.832	326.225	333.632	338.613	343.408	345.966	347.027	347.804
44	420.096	449.159	489.132	550.909	606.835	676.678	733.848	760.164	729.597	747.628	770.376	804.511
45	380.041	390.710	403.453	419.133	433.770	461.099	485.064	499.866	516.030	544.242	568.525	580.836
47	386.042	400.759	420.388	440.038	461.503	481.565	500.759	515.651	529.435	545.093	560.346	577.255
48	392.582	408.286	429.082	450.785	474.872	497.510	519.688	536.644	551.517	568.390	584.493	601.909
49	342.147	354.449	368.482	383.329	399.981	413.255	424.785	437.063	448.345	460.473	474.095	487.013
50	323.042	337.726	352.882	367.537	384.814	396.971	407.838	418.956	430.737	444.041	457.494	470.327
51	327.959	342.713	356.678	370.896	387.030	401.332	412.175	422.282	432.407	442.701	454.147	466.966
52	323.262	338.211	353.685	368.406	386.080	397.310	408.009	418.923	430.715	444.970	459.094	472.470
53	210.118	212.120	231.352	249.050	266.154	284.242	302.837	340.172	378.698	394.345	407.213	390.350
54	325.419	340.270	354.135	368.387	384.193	398.433	409.116	419.237	429.224	439.864	451.479	464.630
55	434.886	433.892	441.534	456.989	469.736	488.700	503.524	521.865	529.938	534.760	548.754	561.560
56	497.718	527.181	558.430	594.313	636.262	685.304	734.169	774.699	812.816	839.040	869.047	890.494
57	424.208	417.524	420.806	432.526	439.819	453.239	461.915	476.276	478.883	479.717	490.742	501.965
58	367.807	366.713	371.730	382.153	391.041	405.623	413.498	421.604	421.765	431.275	438.428	440.770
59	555.106	529.977	526.677	541.114	541.594	548.386	558.502	592.728	603.816	572.003	595.272	636.637
60	557.567	593.436	639.698	695.949	755.340	813.701	870.904	917.452	954.728	989.555	1012.842	1033.134
61	509.550	541.423	577.939	616.381	656.914	695.345	734.467	769.195	804.707	832.270	845.387	867.782
62	542.083	582.000	623.668	669.406	717.562	759.842	807.572	852.533	895.251	930.463	936.984	949.579
63	446.014	476.286	508.233	539.373	574.563	616.930	657.823	691.719	724.165	759.059	794.095	830.878
64	487.406	502.585	531.369	559.758	589.186	618.953	643.462	663.345	689.472	703.757	715.993	743.640
65	593.533	632.553	687.391	760.267	837.857	916.067	991.501	1049.736	1087.453	1129.218	1163.570	1180.319
66	623.144	666.628	728.703	812.356	900.907	992.230	1082.597	1151.039	1192.808	1235.021	1264.830	1275.322
67	456.777	476.879	501.722	531.935	567.389	597.516	620.102	641.981	663.870	699.597	742.286	774.145
68	380.349	396.466	414.998	433.244	449.801	462.146	475.280	491.813	497.811	508.799	515.212	526.628
69	380.212	395.903	411.356	428.073	444.577	461.817	476.095	490.619	505.168	518.001	528.053	535.460
70	397.886	412.574	429.101	446.263	463.584	483.105	500.772	515.380	529.029	541.141	555.028	569.319
71	265.909	283.865	293.216	306.266	317.603	324.641	327.165	338.701	352.128	363.523	365.002	360.864

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1	326.573	338.221	351.689	366.970	383.740	397.612	409.308	418.292	426.919	436.365	445.859	454.205
72	375.627	392.496	417.867	439.434	455.900	457.311	467.788	488.754	474.498	480.936	478.308	499.754
73	478.639	492.133	511.332	526.834	552.303	578.923	602.436	610.011	615.604	622.502	668.791	679.514
74	290.203	305.778	329.692	350.220	361.464	354.107	358.681	381.531	362.234	367.439	350.306	371.508
75	339.394	348.003	353.074	366.642	383.096	398.706	411.326	422.798	432.146	445.365	456.928	469.138
76	301.378	313.064	325.074	341.236	359.863	378.576	390.325	402.825	411.424	420.495	434.505	448.554
77	357.305	372.489	386.217	407.172	428.645	450.315	462.383	474.926	491.000	502.500	520.262	536.728
78	195.834	203.707	212.440	223.047	236.921	252.605	263.170	275.208	276.146	280.981	292.139	306.266
79	346.768	358.274	371.521	387.333	406.831	421.743	432.798	444.001	453.546	464.619	477.173	487.339
80	315.644	324.411	334.888	349.521	365.435	381.103	390.246	398.814	408.908	418.645	428.352	437.007
81	416.091	433.024	451.638	472.089	493.702	513.414	524.312	534.596	543.980	556.817	571.818	588.773
82	412.285	427.963	445.561	465.671	487.047	505.847	516.098	525.487	534.002	545.732	559.148	574.655
83	411.620	427.272	444.873	464.955	486.304	505.163	515.432	524.833	533.345	545.065	558.484	573.987
84	425.026	441.228	458.478	479.005	500.789	516.929	526.451	535.234	543.443	555.125	568.127	583.491
85	443.079	471.230	498.878	522.118	545.440	573.357	590.018	608.393	625.709	648.393	677.370	706.454
86	417.494	428.584	454.630	470.541	494.049	515.800	554.702	560.883	570.119	592.792	616.730	653.278
87	415.630	435.530	451.100	442.239	451.220	474.426	514.058	495.659	492.011	504.497	511.797	543.249
88	400.283	430.362	448.286	426.878	434.922	464.326	517.096	483.029	490.569	500.759	508.920	551.349
89	457.578	451.925	462.221	481.689	492.843	503.342	518.047	528.139	504.419	521.109	527.194	542.645
90	424.461	420.281	464.443	520.380	567.328	587.005	625.102	673.086	706.140	748.416	807.804	852.891
91	430.992	462.177	489.920	511.575	541.319	562.554	594.611	616.599	634.832	658.541	699.925	737.629
92	571.952	604.049	643.221	677.548	692.652	716.219	741.288	797.725	859.122	961.169	1041.629	1153.253
93	456.987	391.564	461.614	574.799	664.573	675.133	709.210	779.745	826.233	898.801	993.446	1075.072
94	381.313	403.575	438.374	473.911	495.084	525.407	584.030	651.452	692.939	723.086	765.783	773.108
95	367.548	376.428	392.182	406.978	423.559	443.797	462.616	478.673	496.604	513.047	527.926	542.715
96	215.335	210.810	210.820	211.319	210.835	215.250	215.657	216.599	220.526	221.432	221.985	223.222
97	192.477	187.836	185.604	185.302	184.731	186.223	186.341	187.246	191.145	190.386	190.721	191.633
98	470.820	472.323	517.116	534.508	536.883	608.791	618.299	620.984	623.497	680.570	682.979	685.060
100	516.311	552.753	593.944	636.218	680.282	736.889	799.363	858.706	910.599	961.614	1012.560	1061.407
101	559.389	601.579	647.314	698.544	754.961	831.611	921.054	1007.462	1078.024	1142.784	1207.729	1269.106
102	548.551	592.932	643.163	692.858	746.392	804.134	862.355	919.745	973.095	1033.290	1084.204	1139.897
103	362.373	376.481	397.643	413.560	423.794	437.705	448.530	455.730	468.887	484.649	506.077	524.094
104	519.628	555.666	578.923	609.771	649.127	684.718	717.077	745.585	773.672	802.910	834.960	869.920
105	387.601	401.816	418.858	439.199	456.671	473.526	486.021	500.007	512.385	523.841	535.255	551.792
106	351.556	364.322	384.885	403.308	420.631	438.729	453.291	466.246	479.322	494.674	509.134	522.939

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
1	326.573	338.221	351.689	366.970	383.740	397.612	409.308	418.292	426.919	436.365	445.859	454.205
107	421.473	430.624	444.670	456.077	468.080	493.442	511.042	526.056	535.954	553.660	570.047	584.642
109	300.540	294.188	312.190	315.499	334.782	355.997	372.740	374.809	386.068	397.539	407.871	412.778
110	379.557	398.159	413.874	427.843	451.634	480.481	492.795	499.759	504.553	512.415	525.881	538.797
111	235.810	231.956	230.046	216.240	199.345	185.418	169.561	161.116	160.970	161.107	163.999	170.825
112	446.634	466.212	493.684	520.810	545.455	570.783	591.487	609.701	627.224	645.012	662.721	679.686
113	552.843	587.844	635.210	694.439	756.141	819.841	881.598	930.655	965.656	1001.146	1031.550	1053.123

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	458.523	465.911	477.512	486.612	493.250	503.282	516.451	531.887	546.492	561.151	579.921
2	325.115	326.814	333.368	333.056	329.641	329.470	334.554	341.845	347.000	351.379	362.869
3	230.585	224.337	220.297	215.931	210.394	202.968	199.217	197.235	194.253	190.754	188.432
4	321.724	322.689	323.883	325.153	323.442	314.611	312.467	317.551	317.951	315.909	312.861
5	278.133	277.951	277.620	276.110	271.610	267.700	265.918	267.230	265.509	262.721	258.791
6	900.806	912.189	923.988	937.807	946.880	881.717	871.095	905.551	906.420	891.977	866.893
7	221.114	220.043	220.819	226.246	230.181	232.423	233.597	239.057	248.741	257.194	270.670
8	239.236	236.125	234.415	230.398	225.666	219.323	216.640	216.774	215.653	213.880	212.545
9	260.086	258.276	256.710	251.939	246.941	240.909	237.950	235.743	234.221	229.984	226.274
10	163.138	159.518	157.906	156.801	155.150	150.339	145.123	149.220	152.942	157.950	159.591
11	373.695	365.906	361.545	351.625	338.871	325.378	324.884	323.039	311.239	305.624	309.229
12	177.620	173.921	173.862	172.912	170.881	167.059	168.889	173.822	175.759	176.136	174.592
13	93.544	85.378	80.013	74.554	69.733	65.398	62.279	59.021	55.615	52.116	49.776
14	32.021	27.563	24.702	21.777	19.400	17.395	15.961	14.475	12.985	11.619	10.548
15	180.334	171.242	165.062	161.549	157.349	156.055	154.164	152.427	150.504	148.327	151.772
16	334.674	342.416	348.826	353.789	352.097	349.328	350.632	356.290	364.667	361.784	365.614
17	596.600	586.033	585.333	592.084	609.782	604.957	606.201	603.828	599.982	605.054	615.229
18	231.727	228.604	228.294	230.454	230.245	228.132	225.305	225.017	224.765	218.913	221.622
19	344.945	336.260	331.811	332.868	326.711	321.481	320.782	316.406	322.538	335.637	352.900
20	243.809	238.011	231.315	231.498	225.258	217.527	218.684	215.531	220.853	231.968	248.051
21	392.989	396.754	405.116	413.010	413.911	415.150	421.934	428.816	438.769	445.836	450.000
22	788.160	820.229	877.341	927.633	995.037	1051.496	1100.183	1146.132	1218.819	1318.602	1410.579
23	409.982	363.503	343.894	339.058	317.535	316.812	299.508	275.058	280.663	308.645	349.747
24	731.002	647.826	585.150	525.191	478.592	426.401	382.759	352.572	320.809	297.476	285.136
25	381.591	391.109	408.098	412.387	412.052	420.725	435.820	453.412	467.989	481.750	508.674
26	427.874	434.882	445.093	458.175	465.198	473.992	488.769	497.389	505.889	525.357	556.707
27	451.859	458.961	469.255	483.636	490.753	500.221	516.391	526.011	535.364	557.262	593.314
28	291.065	297.212	306.147	312.700	318.840	323.970	331.680	335.525	339.975	348.296	359.207
29	286.986	274.504	289.624	308.872	274.290	310.479	358.826	369.508	356.280	386.679	381.251
30	207.469	204.724	202.287	198.277	193.057	188.259	187.619	185.898	185.104	183.366	181.851
31	197.394	195.336	193.106	188.699	183.138	178.210	177.541	174.666	173.535	171.997	169.769
32	170.381	167.351	164.993	161.902	157.204	153.476	153.325	150.394	150.299	149.737	145.944
33	233.590	232.783	230.392	223.265	216.250	209.555	208.613	206.198	202.769	199.668	200.856
34	332.979	340.168	344.038	340.547	333.398	321.994	312.604	307.872	307.414	300.677	300.185
35	257.414	250.768	247.225	245.704	242.723	238.953	238.523	244.170	245.599	242.705	245.970

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	458.523	465.911	477.512	486.612	493.250	503.282	516.451	531.887	546.492	561.151	579.921
36	413.806	448.032	579.097	558.950	522.832	610.813	717.945	880.514	994.329	1077.556	1265.246
37	379.832	413.642	528.514	509.393	478.554	557.364	655.639	798.722	901.294	977.724	1136.118
38	615.346	625.869	917.629	899.698	802.102	970.396	1129.967	1511.944	1724.977	1842.667	2512.443
39	453.309	471.015	481.340	492.515	500.644	501.582	507.624	515.464	526.603	533.706	546.897
40	415.135	433.057	449.349	470.603	491.235	505.250	519.952	535.762	557.337	565.336	578.387
41	270.820	261.803	257.310	255.307	249.723	242.337	241.159	234.830	233.339	231.632	235.229
42	374.764	378.150	387.264	394.928	393.796	381.296	378.318	381.330	385.628	382.836	391.672
43	353.035	358.110	362.836	366.357	365.692	362.121	362.546	363.280	366.462	371.900	374.254
44	874.477	1088.776	1165.660	1208.298	1260.451	1275.215	1299.590	1367.054	1413.725	1507.054	1600.875
45	593.915	600.540	603.230	610.676	618.096	621.021	624.792	635.849	645.209	653.697	667.775
47	590.837	603.999	620.699	639.531	656.737	677.602	699.262	723.223	747.892	773.588	799.754
48	615.220	628.630	645.359	664.534	682.954	706.097	729.754	754.603	780.735	808.218	836.387
49	498.494	510.355	527.586	552.072	568.121	585.961	601.493	622.278	648.923	672.352	696.490
50	485.220	498.668	514.129	534.417	555.846	569.825	583.111	597.407	618.908	641.842	659.794
51	481.166	495.245	512.687	534.872	555.237	570.691	585.131	602.700	624.168	650.657	674.066
52	487.777	501.070	515.976	535.766	557.558	571.173	584.185	597.693	618.451	639.388	655.478
53	393.713	404.545	416.569	432.409	450.068	461.121	471.659	482.486	536.486	607.266	642.203
54	479.372	493.981	511.917	534.541	555.689	572.034	587.278	604.924	626.605	653.306	677.182
55	552.345	554.051	581.117	630.279	611.537	652.307	680.954	741.950	800.861	825.753	890.132
56	919.319	939.678	962.745	990.530	1022.464	1060.073	1123.268	1182.313	1240.648	1303.429	1380.149
57	485.229	483.277	511.382	565.237	536.245	577.990	600.152	661.770	721.177	738.800	801.337
58	423.726	420.410	427.212	457.494	453.055	463.764	472.367	501.605	562.064	584.159	621.534
59	624.745	629.245	742.578	884.567	754.170	925.585	1003.636	1200.048	1229.557	1217.053	1382.143
60	1052.618	1075.723	1106.004	1143.123	1173.027	1217.518	1262.464	1302.423	1342.003	1391.508	1429.096
61	889.278	909.718	931.642	960.826	974.676	995.126	1020.523	1046.025	1065.502	1104.822	1129.728
62	969.920	991.454	1008.655	1037.356	1037.280	1053.430	1074.932	1094.212	1104.650	1149.995	1162.162
63	866.235	906.724	948.058	986.480	1030.498	1072.698	1125.544	1188.072	1249.947	1314.293	1381.882
64	760.519	771.467	791.136	816.333	836.270	853.801	873.980	894.454	911.485	933.980	961.020
65	1196.480	1221.635	1260.515	1305.366	1353.629	1426.287	1494.231	1550.868	1615.230	1674.767	1727.001
66	1284.708	1306.945	1341.587	1381.343	1431.970	1515.242	1589.211	1649.621	1721.824	1781.970	1834.922
67	807.049	837.525	884.419	940.031	976.226	1008.052	1050.283	1089.562	1122.118	1174.940	1220.723
68	535.910	543.907	560.226	566.451	569.074	581.290	589.783	611.434	637.206	651.923	687.270
69	545.674	556.926	572.501	591.367	607.097	618.053	626.847	645.203	667.882	686.135	717.169
70	583.206	599.235	618.273	639.771	663.202	681.936	697.829	721.397	751.775	777.298	815.142
71	363.719	365.993	373.369	384.230	385.613	382.317	377.949	384.172	390.446	394.414	408.782

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	458.523	465.911	477.512	486.612	493.250	503.282	516.451	531.887	546.492	561.151	579.921
72	506.590	506.485	524.409	500.225	471.896	486.711	494.346	522.575	554.609	561.162	605.069
73	685.108	685.099	702.256	724.166	742.867	785.537	823.514	857.854	898.164	912.027	955.417
74	376.928	377.401	395.265	364.047	327.431	335.244	335.301	358.205	384.475	388.613	428.291
75	492.644	477.111	426.686	386.117	370.794	340.051	334.693	338.696	337.433	335.678	330.151
76	459.658	474.436	492.802	508.952	523.593	539.641	553.929	569.476	588.667	604.858	623.673
77	550.077	575.480	602.437	625.459	642.513	666.193	682.238	700.378	725.662	748.816	768.994
78	316.866	323.912	333.077	341.730	355.906	365.768	375.098	382.526	394.637	400.654	409.961
79	494.573	505.545	522.418	537.111	545.755	558.226	573.132	592.452	611.559	629.101	652.965
80	447.272	462.217	486.329	507.887	525.110	545.111	565.201	587.234	607.975	633.284	662.523
81	604.549	620.173	637.507	655.676	671.577	685.876	708.667	731.422	755.925	785.167	816.260
82	588.832	603.450	618.673	637.694	655.164	669.640	689.920	711.339	734.016	761.026	794.430
83	588.224	602.873	618.298	637.633	655.134	669.336	689.646	711.136	733.765	760.838	794.318
84	595.081	608.014	615.315	621.617	637.518	662.195	680.479	698.666	722.469	746.643	776.287
85	735.539	759.524	794.381	805.189	806.993	819.605	863.797	897.666	937.181	984.829	997.522
86	668.823	675.497	681.464	677.621	696.253	727.765	767.605	795.545	813.866	849.053	874.988
87	552.338	549.402	546.317	535.972	548.750	564.375	581.583	597.943	610.912	634.926	657.385
88	582.242	598.910	621.614	616.123	639.013	660.987	673.729	689.893	697.675	727.423	760.179
89	523.111	498.776	472.115	457.726	461.504	471.561	491.863	507.924	524.345	543.265	557.101
90	883.393	916.681	949.747	967.563	1000.370	1074.430	1175.280	1232.894	1263.827	1326.495	1356.430
91	778.614	816.975	876.560	879.722	947.117	985.811	1033.756	1075.731	1106.519	1140.910	1148.064
92	1169.973	1242.084	1332.643	1461.738	1628.367	2027.548	2163.672	2274.795	2303.594	2418.471	2566.606
93	1094.872	1115.491	1150.736	1183.235	1190.897	1293.613	1459.505	1517.220	1573.115	1644.773	1689.304
94	805.268	849.791	842.664	854.740	881.071	945.546	1014.210	1099.868	1091.047	1185.537	1219.215
95	553.792	567.314	578.232	596.122	619.357	642.240	663.760	688.848	712.420	732.755	763.374
96	221.502	217.212	211.055	209.112	210.874	210.942	207.819	206.254	206.373	201.580	205.033
97	189.306	184.955	179.226	176.257	177.196	176.407	173.725	172.512	173.606	176.706	179.654
98	689.620	712.478	719.076	751.442	792.124	834.085	851.891	863.558	914.525	945.078	1000.613
100	1109.756	1165.141	1222.144	1287.509	1370.509	1476.772	1602.805	1720.578	1829.646	1933.276	2045.320
101	1322.755	1375.072	1431.980	1504.838	1607.524	1742.169	1907.216	2050.021	2187.372	2324.354	2469.393
102	1212.881	1285.846	1370.013	1453.792	1547.924	1642.536	1740.672	1845.359	1950.950	2052.482	2164.052
103	543.087	582.986	615.874	649.284	682.943	733.179	791.515	857.118	905.846	942.093	985.198
104	910.427	952.954	998.836	1047.307	1098.019	1144.186	1188.619	1238.390	1296.037	1348.731	1403.628
105	560.649	575.431	594.525	618.816	633.280	648.624	667.496	693.049	718.061	743.835	780.948
106	539.398	555.667	580.801	597.151	615.426	632.897	649.288	675.083	697.556	719.962	741.626

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Line	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	458.523	465.911	477.512	486.612	493.250	503.282	516.451	531.887	546.492	561.151	579.921
107	600.877	619.193	645.951	674.020	696.462	714.915	732.812	762.544	789.942	809.692	835.596
109	403.255	414.562	417.621	422.454	436.820	464.101	495.739	529.325	551.800	587.587	635.295
110	545.822	560.399	587.050	592.320	593.136	611.189	638.181	669.613	701.373	729.229	764.832
111	182.045	188.515	198.903	208.094	209.771	206.565	205.776	213.908	218.409	221.449	223.601
112	700.027	719.162	747.493	776.143	799.105	824.841	852.046	885.897	917.939	946.200	971.749
113	1073.704	1100.238	1137.725	1178.091	1222.551	1284.239	1343.747	1397.233	1454.925	1508.272	1558.334

Source: Bureau of Economic Analysis, National Income and Product Accounts, Personal Consumption Index, Table 2.4. Reindexed by author.

Appendix G: Research Database Used to Conduct ANOVA Analysis

Year	All Goods	Durable Goods	Non Durable Goods	Services	Higher Education	HEPI Index
1961	100.00	100.00	100.00	100.00	100.00	100.00
1962	100.52	100.43	100.54	101.90	103.79	103.52
1963	101.35	100.81	101.55	103.46	107.59	107.81
1964	102.45	101.27	102.90	105.40	111.62	111.72
1965	103.53	100.44	104.76	107.37	116.48	116.41
1966	105.81	100.22	108.11	110.49	122.35	121.48
1967	107.68	101.83	110.08	114.17	128.58	128.52
1968	111.43	105.09	114.05	119.10	136.37	136.33
1969	115.75	108.06	118.98	125.31	145.55	144.92
1970	120.17	110.38	124.33	132.26	155.76	154.30
1971	123.78	114.20	127.84	139.47	165.50	164.45
1972	126.94	115.46	131.94	145.39	174.66	173.05
1973	134.52	117.17	142.58	152.44	184.24	182.42
1974	151.30	124.86	164.14	165.39	200.12	194.92
1975	163.53	136.03	176.83	179.62	214.97	212.11
1976	169.93	143.47	182.59	192.07	229.79	225.78
1977	179.00	149.90	193.05	206.55	244.92	240.23
1978	189.98	158.29	205.39	222.60	258.41	256.64
1979	207.95	168.78	227.53	241.22	279.07	275.39
1980	231.24	183.43	255.44	266.18	305.64	302.73
1981	248.42	195.69	275.17	293.32	343.50	335.16
1982	255.19	203.33	281.41	316.14	389.77	366.80
1983	259.79	207.45	286.24	335.81	430.34	390.63
1984	264.71	210.51	292.19	353.29	474.40	409.38
1985	268.95	212.74	297.66	369.23	517.59	432.81
1986	267.70	215.08	293.86	386.04	559.39	454.30
1987	276.30	221.27	303.85	400.76	601.58	472.27
1988	283.59	224.92	313.52	420.39	647.31	492.97
1989	294.50	229.02	329.07	440.04	698.54	518.75
1990	306.56	231.29	347.93	461.50	754.96	550.00
1991	314.05	234.68	358.09	481.57	831.61	578.91
1992	317.84	236.30	363.29	500.76	921.05	599.61
1993	320.60	238.63	366.25	515.65	1007.46	616.80
1994	323.86	243.30	368.20	529.44	1078.02	637.89
1995	326.89	245.07	372.05	545.09	1142.78	656.64
1996	330.48	242.60	380.47	560.35	1207.73	675.78
1997	330.10	237.30	384.44	577.25	1269.11	696.88
1998	325.12	230.59	381.59	590.84	1322.76	721.48
1999	326.81	224.34	391.11	604.00	1375.07	738.67
2000	333.37	220.30	408.10	620.70	1431.98	769.14
2001	333.06	215.93	412.39	639.53	1504.84	815.23
2002	329.64	210.39	412.05	656.74	1607.52	830.86
2003	329.47	202.97	420.73	677.60	1742.17	873.05
2004	334.55	199.22	435.82	699.26	1907.22	905.08
2005	341.85	197.23	453.41	723.22	2050.02	940.63
2006	347.00	194.25	467.99	747.89	2187.37	988.67
2007	351.38	190.75	481.75	773.59	2324.35	1016.80
2008	362.87	188.43	508.67	799.75	2469.39	1067.19

Source: Higher Education Price Index, 2004 Update, Higher Education Price Index, 2009 Update, National Income and Product Accounts, Personal Consumption Index, Table 2.4, Reindexed by author, Base Year 1961= 100

Appendix H: Future Research: Creating a Model of Cost and Price Escalation in Higher Education

This research has focused on the extent to which cost and price escalation in higher education can be explained by the presence of a cost disease. The research results suggest that higher education costs are statistically not different from price increases associated with the service sector, however, tuition sticker prices were found to be significantly higher than those associated with the services. While the failure of government support to increase at the rate of college costs on per-capita student basis is a cause, this analysis also highlighted the widespread use of tuition discounting as well. This suggests that a more holistic model be developed to explain cost and price behavior associated with non-profit institutions of higher education, one which reflects the impact of college costs and revenue, but also encompasses behavioral factors associated with the pursuit of excellence and prestige and the competition which these factors may engender. The model detailed below provides a conceptual framework to holistically view these factors. Future researchers may attempt to assess the part each plays in impacting higher education cost and price increases.

A Model of Cost and Price Escalation in Higher Education

The model detailed below provides an initial exploration of the interactions between the market structure associated with higher education and its impact on cost and price escalation. There are four major components within the model: a revenue subsystem, an expenditure subsystem, a derived student subsidy system, and a quality market composed of both students and institutions.

Revenue Subsystem

Institutions receive revenue from four potential sources: government, endowment income dedicated to current operations, current gifts, as well as tuition revenue. Public institutions receive a relatively greater share of their revenues from government, while certain private institutions have substantial endowments which they use to fund current operations. Depending on the amount of revenue provided by government or gifts, institutions will rely on tuition to a greater or lesser extent to meet their revenue requirements. The total amount of government support, endowment, or current gifts can change from year to year based on increased or decreased government allocations, or relative changes in the amount and return on investment for institutional gifts.

In order to make meaningful comparisons between institutions, we must create a standard measure which accounts for the variability in the populations of students attending different institutions, as well as different amount of their revenues and expenditures. Thus, revenue and expenditures must be assessed on a per-capita basis. (See section on Operationalizing Variables for more detail). Since institutions vary in the number of full and part-time students they serve, the number of undergraduates should be counted on a full-time equivalency basis. This also enables us to create equivalent comparative revenue and expenditure assessments, through the addition of per-capita revenue and per-capita expenditure variables.

Expenditure Subsystem

Expenditures are composed of personnel costs, non-personnel costs, and institutional non-endowed aid funded from operating revenue which is not supported by other sources of gift aid. This component of institutional non-endowed aid can be viewed

as the increasing reliance and importance of tuition discounting used by colleges and universities as a way to tailor their institutional profile to increases certain indices of student quality among their enrolled population of students.

The total amount spent for personnel, non-personnel items and institutional merit aid items associated with undergraduate instruction yields the total UG Instructional and General Educational Costs. When assessed against the number of full-time equivalent undergraduates, we are able to derive Per Capita Educational and General Costs.

As detailed in the literature review, one of the potential issues affecting annual tuition increases in higher education are the rate of cost increases associated with the *production function of colleges and universities* (Baumol, 1967, 1993; Baumol & Bowen, 1966; Bowen, 1980; Clotfelter, 1996, 1999; Ehrenberg, 1999, 2000).

These can be seen as intrinsic costs associated with the purchased labor and non-labor inputs used in producing educational services provided in undergraduate education. The model takes these into account with two variables – a Personnel Cost Increase Rate and Non-Personnel Cost increase Rate, which impact Personnel and Non-Personnel Costs for the upcoming academic year.

The Market for Higher Education: Quality Markets and Student Subsidies

However, there is great variability in the amount institutions spend in the production of educational services, as well as the tuition they charge (Bowen, 1980; Winston, 1996). Further, the pressures on cost and price seem to be connected to the market structure and prestige hierarchy associated with institutions of higher education. Any model attempting to explain both the variability in tuition prices and spending by institutions along with the cost and price pressures they face must account for the

structure of the higher education market which influences their behavior. (Rothschild & White, 1995; Winston, 1999, 2003; Winston & Zimmerman, 2000). As described by Rothschild (1995) and Winston (1996, 1999), the market for higher education is somewhat unique; it utilizes a customer input technology in which the presence of particular students influences the quality of the educational experience of other students. Under these conditions, the student is simultaneously both a customer and an input into the educational process.

This is reflected in the "Quality Market" subsystem used in the model. The quality market is composed of both institutions (Tier Institutional Quality) and students (Student Quality). Institutional selectivity helps define both institutional quality as well as the average quality indicators of those applicants who are accepted and eventually enroll at the institution.

However, institutional quality is partially defined through competition with and in comparison to other institutions, particularly those considered within one's peer group (Clotfelter, 1999; Ehrenberg, 2000; Massy, 2003; Winston, 1999, 2003; Winston & Zimmerman, 2000). These competitive pressures, particularly on spending, are reflected in the influence of the Average Peer Group Per Capita Subsidy and average Peer Group Instructional and Educational Expenditures on institutional quality.

Student Subsidy Subsystem

The competition between institutions for student quality is heavily influenced by the resources available to institutions. Institutions which are able to provide significant donative resources purposely create an excess demand queue for their product, since they

are able to provide a substantial return on a student's tuition investment. They use this excess demand queue to select those students whom they feel will contribute to peer quality. They are thus able to create a high quality academic program by ensuring they remain selective in choosing their student body (Winston, 1999).

This critical link between the donative resources provided by institutions and measures of institutional and student quality is encapsulated in the Student Subsidies subsystem. Tier Institutional Quality and Institutional Selectivity are heavily influenced by the Per Capita Non-Tuition General Subsidy made possible through non-tuition based revenue available to an institution.

In addition to donative resources used to provide a general subsidy for all students, institutions can utilize a portion of their donative non-tuition revenues as well as aid based on tuition discounting to provide individual student subsidies. This is increasingly being used by institutions which do not have large endowments as the most elite institutions, often in an attempt to provide attractive, targeted financial aid packages to entice highly desirable students to enroll. This is reflected in the model through the inclusion of the Per Capita Individual Subsidy influencing matriculation decisions, based on indices of student quality.

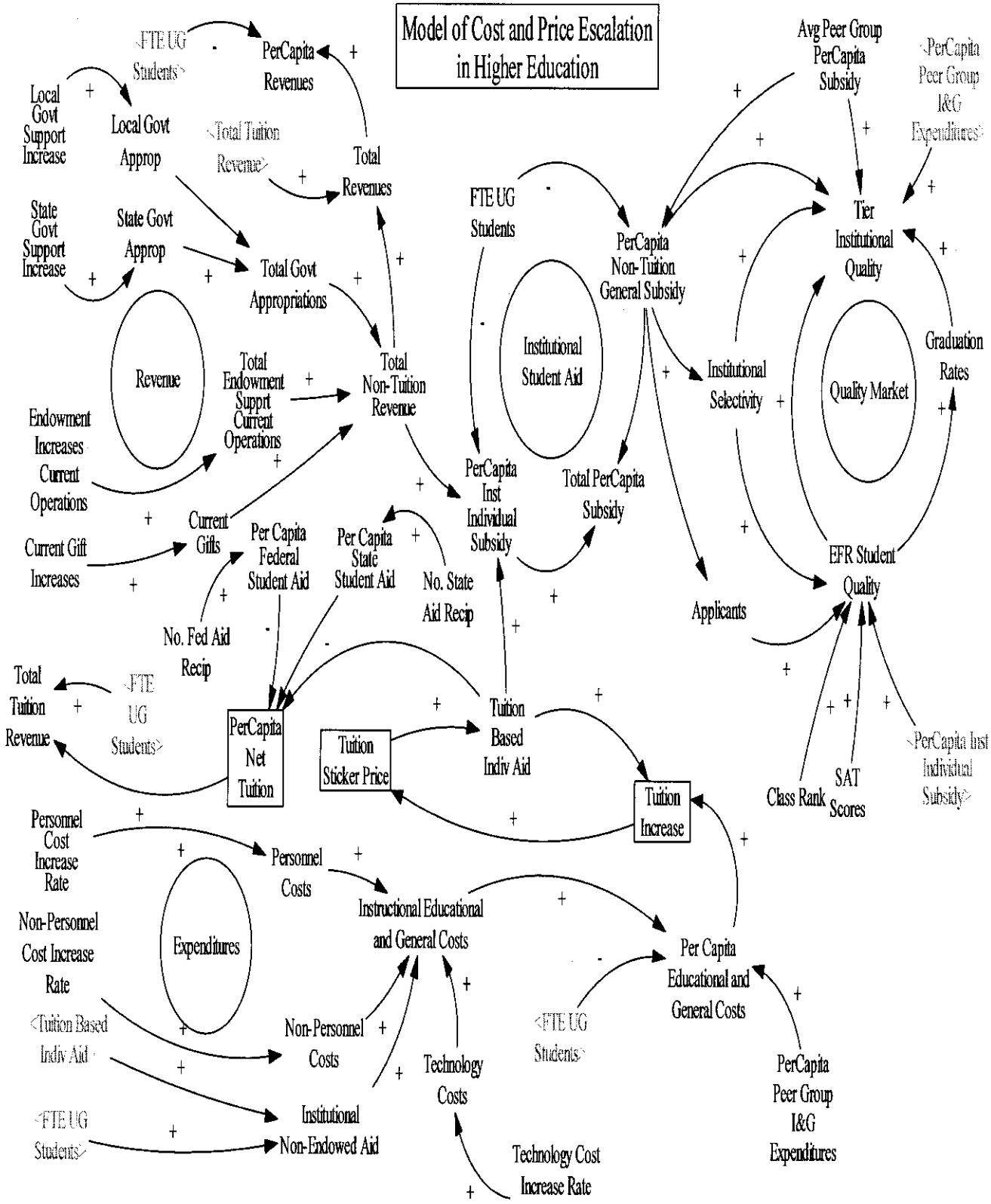
Tuition Sticker Prices and Tuition Increases

Tuition sticker prices and tuition increases can be viewed as the residual effects of the strange market associated with higher education; tuition increases are generated through differences between the total Per Capita subsidy available to undergraduate full-

time equivalent students, and the Per Capita Educational and General Costs expended on a full-time equivalency basis.

However, it is a market where educational services are consistently sold at a loss, since institutions subsidize costs to the extent that their donative resources allow. The competition for student excellence creates unusual cost and price pressures on institutions, which I hope to explore in greater detail utilizing systems dynamics modeling. A visual representation of the model is displayed in Figure 1.

Figure 1: Model of Cost and Price Escalation in Higher Education



Model Variables

The proposed model of the factors affecting cost and price escalation in higher education contains a total of 42 variables, which are detailed below.

(01) Applicants - Total number of students applying to an institution. This is influenced by Institutional Selectivity and the Per Capita Non-Tuition Subsidy.

(02) Avg Peer Group PerCapita Subsidy – The average per capita general subsidy provided by other members of an institution's peer group. This influences the assessment of the an Institution's tier quality ranking, as well as the institution's own Per capita non-tuition general subsidy.

(03) Class Rank - The average high school class rank of those students accepted by the institution.

(04) Current Gift Increases - Annual changes in current gifts resulting in the amount of current gifts donated to an institution for the current operating year.

(05) Current Gifts - Annual gifts donated to an institution to be used for current operations. This changes annually based on increases or decreased donations through Current Gift Increases.

(06) Endowment Increases Current Operations – Annual changes in donations for current operations from an institution's endowment. This impacts Total Endowment Support for Current Operations.

(07) FTE UG Students - Total number of matriculated full and part time undergraduate students converted to a full time equivalent number.

(08) Fed Govt Support Increase – Changes in Federal Government support for current operations. This impacts Federal Government Appropriations. (Fed Govt Approp).

(09) State Govt Support Increase – Changes in state government support for current operations. This impacts State Government Appropriations (State Govt Approp.)

(10) Graduation Rates - The institution's five or six year graduation rate. It is affected by student quality indices of students matriculating into the institution (Student Quality). This impacts the institution's quality ranking (Tier Institutional Quality).

(11) Institutional Non-Endowed Aid – Amount of institution's current operating budget dedicated to student financial aid, not funded through gift sources of aid.

(12) Institutional Selectivity - The institution's acceptance rate. This impacts the Tier Institutional Quality ranking associated with an institution, as well as indices of student quality of students whom the institution accepts among its applicant pool. In turn, this is impacted and partially defined by the Per Capita Non-Tuition General Subsidy provided by the institution.

(13) Instructional Educational and General Costs - Total amount spent on Undergraduate Educational and General costs. This is the total amount spent on Personnel (Personnel Costs), non-personnel related expenditures (Non-Personnel Costs) and financial aid funded through the institution's operating budget (Institutional Non-Endowed Aid).

(14) "Non-Personnel Cost Increase Rate – The rate of increases in the cost of non-personnel related items purchased by the institution.

(15) Non-Personnel Costs – The amount of money spend on Non-personnel related items.

(16) PerCapita Peer Group I&G Expenditures - The Per Capita amount spent on Instructional and General Educational Expenditures among the peer group associated with an institution. The amount spent by peers impacts the amount of spending by the institution, since indices of quality are based on relative assessments among a peer group.

(17) Per Capita Educational and General Costs – The Per Capita amount spent on Instructional and General Educational Expenditures by the institution. This is derived by taking the total amount spent on Instructional and General Educational Costs and dividing it by the number of full-time equivalent students.

(18) PerCapita Inst Individual Subsidy - The average Per Capita amount awarded to students as individual merit or need-based aid. It is derived by totaling the amount of Non-Tuition revenue devoted to individual student aid (Total Non-Tuition Revenue not offered as a Non-Tuition General Subsidy, from Government Appropriations, Endowments devoted to current operations, Current Gifts, and the differences between the Tuition Sticker price and Net Tuition, based on a Full-time equivalency basis.

(19) PerCapita Net Tuition - The average net tuition undergraduate students actually pay the institution, formatted on a full-time equivalency basis.

(20) PerCapita Non-Tuition General Subsidy - The average Per Capita amount granted to all students as part of a general subsidy provided by the institution. It is derived by totaling the amount of Non-Tuition revenue devoted the institutional general subsidy (from Total Non-Tuition Revenue, Government Appropriations and Current Gifts), based on a Full-time equivalency basis.

(21) PerCapita Revenues – Total revenue to support undergraduate education, on a full-time equivalency basis. Derived by totaling all Non-Tuition and Net Tuition Revenues, divided by the number of full-time equivalent students.

(22) Personnel Cost Increase Rate – The average annual increase in costs for Personnel-related expenditures. Impacts the annual amount spent on personnel related expenditures.

(23) Personnel Costs - The annual amount spent on Personnel related costs.

(24) SAT Scores – The average SAT Scores of applicants accepted for admittance by the institution.

(25) EFR Student Quality – The average SAT and Class Rank of those applicants accepted for admittance. These indices are determined by the institution's standards of selectivity (Institutional Selectivity).

(26) Tier Institutional Quality - The Tier and Quality Ranking associated with an institution. This is impacted by Institutional Selectivity, the Per Capita Non-Tuition General Subsidy, as well as indices of Student Quality of the student applicants whom the institution accepts, and enrolls. The graduation rate further impacts measures of institutional quality. In addition, the Average Per-Capita Subsidy and Per Capita Instructional and General Educational expenditures provided by institutions among its peer group also help determine the relative quality ranking associated with an institution.

(27) Total Endowment Support Current Operations – The amount of endowment income devoted to current operations supporting undergraduate education.

(28) Local Govt Approp – Local Government Appropriations. The Total amount of local government appropriations supporting current undergraduate education.

(29) State Govt Approp – State Government Appropriations. The Total amount of state government appropriations supporting current undergraduate education.

(30) Total Govt Appropriations – The Total Amount of Government Appropriations devoted to supporting current undergraduate education. (Combined State and Federal Government Support).

(31) Total Non-Tuition Revenue – The total amount of revenue from non-tuition sources used to support undergraduate education. This is derived by totaling the amounts provided through Current Gifts, Total Endowment Support for Current Operations, and Total Government Appropriations.

(32) Total PerCapita Subsidy – The total average amount of revenue used to subsidize undergraduate education, on a full-time equivalent basis. This is derived by adding the Per Capita Inst Individual Subsidy and Per Capita Non-Tuition General Subsidy.

(33) Total Revenues – Total revenue to support undergraduate education. Derived by totaling all Non-Tuition and Net Tuition Revenues.

(34) Total Tuition Revenue – The total amount of revenue received from tuition. This is derived by multiplying the Tuition Sticker Price by the number of full-time equivalent students.

(35) Tuition Based Indiv Aid – The average individual aid award offered to students from tuition derived revenue. This is derived based on the difference between the Tuition Sticker Price and Per Capita Net Tuition.

(36) Tuition Increase – This is the annual increase in the Tuition Sticker Price. Derived by subtracting the new year's Per Capita Educational and General Costs from the Total Per Capita Subsidy available to fund current operations.

(37) Tuition Sticker Price – An institution's published tuition and fee schedule for a particular academic year. In the model, this is derived by comparing the Current Tuition Sticker Price, the Total Per Capita Subsidy and anticipated Per Capita Educational and General Costs for the upcoming academic year. Any Tuition Increase is added to ensure revenues and expenditures balance.

(38) Per Capita Federal Student Aid – Average Per Capita award for Federal Student Aid.

(39) No. Fed Aid Recipients – Number of students awarded Federal student aid.

(40) Per Capita State Student Aid – Average per capita award for state student aid.

(41) No. State Aid Recipients – Number of students awarded state student aid.